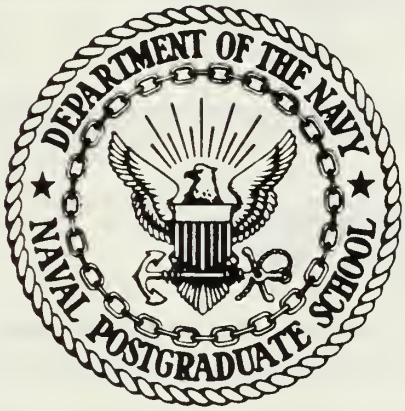
1986

An analysis of factors affecting the retention of medical officers in the United States Navy.

Whalen, William Patrick.;Mehay, Stephen L.

NAVAL POSTGRADUATE SCHOOL
Monterey, California



THESIS

AN ANALYSIS OF FACTORS AFFECTING THE
RETENTION OF MEDICAL OFFICERS
IN THE UNITED STATES NAVY

by

William P. Whalen

December 1986

Thesis Advisor: Stephen L. Mehay

Approved for public release; distribution is unlimited

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b DECLASSIFICATION/DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b OFFICE SYMBOL (If applicable) Code 54	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000
8a NAME OF FUNDING/SPONSORING ORGANIZATION 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification)
AN ANALYSIS OF FACTORS AFFECTING THE RETENTION OF MEDICAL OFFICERS IN THE UNITED STATES NAVY

12 PERSONAL AUTHOR(S)
Whalen, William P.

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	1986 December	114

16 SUPPLEMENTARY NOTATION

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Physician retention, medical officer recruitment, regression analysis, physician specialty pay

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This thesis examines factors influencing a Navy physician's decision to stay or leave the service in FY85 using the LOGIT nonlinear estimation technique, data contained in the Navy Medical Officer File, END FY85, and after removing officers obligated to remain in service.

Several regression models indicated that a physician's specialty and source of entry were significant in this career decision. Specifically, executive medicine officers, surgeons, pediatricians, OTHER physician specialists, and internists were found less likely to leave than hospital-based or general medical officers. Similarly, physicians entering the Navy via the Armed Forces Health Professions Scholarship Program were more likely to leave than volunteers or medical officers who entered the Navy through earlier commissioning programs. In addition, physicians were less likely to leave the service if they received an increase in military pay, were augmented into the regular Navy, had received aviation medicine training, were a foreign medical

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL Stephen L. Mehay	22b TELEPHONE (Include Area Code) (408) 646-2643 22c OFFICE SYMBOL Code 54Mp

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

#19 (Cont'd)

graduate, were older, were more senior in grade, were aliens or naturalized citizens, had longer length-of-service, or were not eligible to retire.

Approved for public release, distribution is unlimited.

An Analysis of Factors Affecting the Retention of Medical Officers in the United States Navy

by

William Patrick Whalen
Lieutenant Commander, Medical Service Corps, United States Navy
B.B.A., University of Michigan, 1974
M.H.H.A., Xavier University, 1976

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1986

ABSTRACT

This thesis examines factors influencing a Navy physician's decision to stay or leave the service in FY85. Data contained in the Navy Medical Officer File, END FY85 were analyzed using the LOGIT nonlinear estimation technique. The sample was restricted to officers who were not obligated to remain in the service.

Several logistic regression models indicated that a physician's specialty and source of entry were significant in this career decision. Specifically, executive medicine officers, surgeons, pediatricians, OTHER physician specialists, and internists were found less likely to leave than hospital-based or general medical officers. Similarly, physicians entering the Navy via the Armed Forces Health Professions Scholarship Program were more likely to leave than volunteers or medical officers who entered the Navy through earlier commissioning programs. In addition, physicians were less likely to leave the service if they received an increase in military pay, were augmented into the regular Navy, had received aviation medicine training, were a foreign medical graduate, were older, were more senior in grade, were aliens or naturalized citizens, had longer length-of-service, or were not eligible to retire.

TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGEMENTS

This thesis is the result of the assistance of many individuals who contributed to the research effort and are presently acknowledged for their guidance. Ms. Carol Mullins, Navy Personnel Research and Development Center, San Diego and Lieutenant Jim Moody, Navy Liaison, Defense Manpower Data Center, Monterey assisted in the procurement and initial investigation of the Medical Officer File. Ms. Kathy Kocher and particularly Ms. Helen Davis provided continued insight and guidance into the regression models developed. Lieutenant Shane Brannman, Naval Medical Command, Washington, D.C. provided continuous assistance with the data file. Professors Stephen Mehay and Kenneth Coffey, Naval Postgraduate School provided organizational guidance in the development and presentation of this research effort and findings. Additionally, LCDR Margaret Shannon, MC, Naval Hospital Long Beach provided a medical officer's perspective and support throughout the development of this project.

I. INTRODUCTION

Recent discussions within the Department of Defense (DOD) indicate concern that military medicine "can give full treatment to only 35 percent of the casualties they expect in a full-scale conventional war" [Ref. 1]. According to William E. Mayer, Assistant Secretary of Defense for Health Affairs, military medicine "exists to be able to ... take care of the troops ... and I know at this moment we are not able to do that .... We are now, by God, doing something about it." This "something" to improve medical readiness means "military hospitals will focus on the care needed to sharpen combat skills." This involves the added problem of adjusting "the mix of patients that come into the military treatment facilities so that ... adequate work (can be given) to at least a larger number of surgeons than we have now ..." [Ref. 2]. The care within military medical facilities will "shift gradually toward surgery and other skills relevant to combat, while other types of care such as pediatrics will shift to civilian facilities" [Ref. 1]. "We've got to have a large number of general practice people in my hospitals to take care of the people we have, but I can't have 80 percent of them in general practice" [Ref. 2].

The perceived ability to provide care for only one-third the casualties incurred in a conventional war suggests the need for substantial increases in the number of Navy surgeons and hospital-based physicians (anesthesia, laboratory, x-ray). Surgeons to provide immediate and potential life-saving care and hospital-based medical officers to complete the team effort required to provide this necessary patient care. If strictly interpretted, Assistant Secretary Mayer's figures could suggest a possible tripling of these physician specialties. Given that the number of Navy surgeons and hospital-based medical officers at the end of FY85 was 378 and 433, respectively, this would suggest an increase of 1622 (2 X 811) physicians within these two specialties along with a complementary decline in other types of Medical Department officers in order to maintain authorized personnel ceilings.

Plans to improve the readiness of military medicine with concurrent implications for altering the structure of the Naval Medical Corps to a more surgically-oriented, combat ready force may prove to be neither easily nor promptly accomplished. In fact, no specific personnel objectives apparently now exist to move toward this new military medical readiness system. Although no specific targets appear to have been established, plans do exist to "form a panel of respected experts in medical education to examine military training programs ... to begin meetings

this (FY86) year" [Ref. 2]. Aside from personnel, budgeting 'targets' for medical readiness equipment have increased sharply. DOD's 1986 budget calls for $500 million, up from $300 million in 1985, for combat medical facilities [Ref. 3]. This thesis will analyze the factors that affect the retention rates of surgeons and hospital-based physicians. The results indicate that surgeons and hospital-based physicians may be difficult specialties not only to retain, but to increase due to higher expected civilian earnings.

In the past year, this "shift" towards a more surgically-oriented and improved Navy medical system has meant an increase in Navy Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) referrals to civilian medical providers and a redoubling of efforts to simultaneously improve medical readiness and the quality of patient care. Improvements in readiness and quality have been lauded, but the additional costs generated by the referral of eligible beneficiaries to civilian care may prove to be quite expensive for the government and troublesome for beneficiaries. Increases in combat medical readiness can thus be viewed as offset by reductions in available military facility medical care to eligible beneficiaries other than active duty.

Given that the current physician mix is deficient--that is, lacking in sufficient numbers of surgeons and hospital-based medical officers--how does Navy medicine correct

this shortfall? Specifically, how can the Navy Medical Department improve retention and increase the numbers and mix of physicians considered necessary to improve overall operational or combat readiness?

To examine this problem, one should begin with an understanding of factors which are shown to significantly affect retention of all Navy physicians in general, and surgeons/hospital-based physicians in particular. An empirical analysis which attempts to identify and explain factors that influence retention behavior could prove beneficial in formulating policies necessary to maintain the appropriate number and mix of Navy physicians to realize an operationally-ready medical force. In addition, an accurate picture of the status of the Navy medical officer community may suggest alternative methods for improving the force.

Discussed in the context of other officer communities, the retention rate for military physicians is one of the lowest of any specific military community. Although the retention rates of Navy nuclear officers and pilots have been erratic and troublesome over the years, their continuation rates are exemplary when compared to the Navy Medical Corps. Table 1 shows this by comparing the continuation rates for these selected officer populations with those of DOD physicians and all Navy officers. This table is presented to establish a perspective from which the retention

TABLE 1

PERCENTAGE OF SELECTED OFFICER COMMUNITIES
WITH GREATER THAN 14 YEAR CONTINUATION RATES (LOS)

COMMUNITY	FY83	FY84	FY85
NAVY PHYSICIANS	13%	13%	13%
DOD PHYSICIANS	12%	13%	13%
NAVY PILOTS	32%	32%	33%
NAVY NUCLEAR	41%	40%	37%
ALL NAVY OFFICERS	30%	32%	32%

SOURCE: OFFICER CONTINUTATION DATA BASE, DEFENSE MANPOWER DATA CENTER (DMDC)

rate for Navy physicians may be evaluated--that is, to suggest more meaning to "13%" than this solitary figure alone might give. The point emphasized is that the percentage of 'career' medical officers, judged here by the percentage of the force with length-of-service greater than 14 years, is comparatively very small. As shown, medical officers exhibit overall career retention characteristics that are approximately one-third of the closely monitored nuclear and pilot communities and 42 percent of all Navy officers (excluding warrant officers). This retention problem appears to be shared by all the services as indicated by the low officer continuation rates for all DOD physicians.

Despite this lower retention rate for medical officers vice Navy pilots and nuclear officers, recent articles appear more concerned about the future manning needs of these non-medical communities. For example, a shortage of 1,100 pilots in the grades of lieutenant and lieutenant commander (in a total community of 12,000) has led to a "major effort for retention" with a proposed increase in Aviation Officer Continuation Pay (AOCP) from $6,000 per year to $8,000 per year for six-year contracts [Ref. 4]. Similarly, "Navy manpower officials are looking at the possibility of making special pays for nuclear-trained officers and enlisted persons as one way of reversing falling retention figures, which are becoming a concern" [Ref. 5]. Perhaps an increase in physician pay to increase medical officer retention also needs investigation.

Compounding the problem of maintaining career medical officers is the difficulty of sustaining the proper mix of military physicians. The Medical Officer File, which contains the data upon which this study is based, contains 62 separate classification categories for Navy physicians. Similarly, the Naval Military Personnel Command (NMPC) lists 52 categories of authorized Navy Medical Corps officers. Unfortunately, the unfamiliarity of the author with the NMPC file and its different method of classifying some physicians when compared to the Medical Officer File, which is utilized in this thesis, prevented a desired

comparison of authorized versus actual physician billets. However, this large number of specialties in an active force of nearly 4,000 increases the complexity of retaining not only the appropriate overall number, but the right mix of physicians.

The purpose of this thesis is to formulate an explanatory model with which to examine and identify significant factors affecting Navy physician retention in general, and surgeons/hospital-based medical officers in particular. The model is estimated using a logistic regression procedure with data obtained from the Medical Officer (BUMIS) File, END FY85. The objective of the thesis, in part, is to analyze the relative effects of economic versus other factors in explaining a physician's decision to stay or leave the Navy. This will permit an assessment of those policies that may be more cost-effective in reaching the Navy's goals.

After a brief discussion of related work which similarly analyzed factors related to physician satisfaction and retention in Chapter II, Chapter III identifies the characteristics of the Navy medical officer community at the end of FY85. The primary focus of this chapter will be to document cross-tabulations of these characteristics by physician specialty and by whether the physician remained or left the service. Chapter IV continues this discussion and shows how the explanatory models were constructed.

Chapter V presents the results of several models estimated with the logistic regression procedure. In Chapter VI, several policy recommendations are presented for possibly improving Navy physician retention and the structure or mix of this community.

II. BACKROUND

Numerous prior studies and data analyses have examined personnel retention in the military service. The majority of these studies, however, have dealt with enlisted as opposed to officer retention behavior. Even fewer studies have examined the retention of medical officers within DOD, and only a handful of studies in recent years have investigated factors surrounding Navy medical officer decisions to remain in or leave the service. No studies known to the author have exclusively dealt with the recruitment, retention and training of surgeons and hospital-based physicians.

The data for this thesis is the FY85 Medical officer File (MOF) maintained by the Naval Medical Command. The MOF is the physician portion of the larger BUMIS File. The BUMIS File contains military and medical-specific data on all medical staff corps officers (Medical, Medical Service, Nurse, Dental). The Medical Officer File contains general information on the military careers of physicians as well as specific information concerning medical training, specialty, and commissioning program through which the individual entered the service. Each fiscal year's data is reconciled with the Officer Master File maintained

by the Naval Military Personnel Command to ensure accuracy and completeness.

Prior to the reorganization of the Naval Medical Department in 1982, each medical staff corps maintained their own data file. Subsequent to reorganization, these data files became centrally managed. This centralization, together with an increase in computerized management information systems, has dramatically improved the quantity and quality of information available. As shall be noted, an earlier study of FY82 Navy medical officer behavior was severly hampered by missing values of up to 25 percent in many relevant data fields. The same fields examined in the FY85 MOF show less than one percent missing values with only one field greater than four percent.

The FY85 MOF primarily contains information on medical officers who continued, were a loss, or a pending gain to the Naval service. As shall be described in detail later, the data fields were cross referenced to provide a division of officers who were either a non-obligated stayer (N=1072), a leaver (N=492), or obligated to remain in the Navy through FY85 (N=2833). Obligated physicians were eliminated from subsequent regression analysis to form a cohort of "true" stayers and leavers. Unfortunately, reconciliation of the FY86 Medical Officer File with NMPC was completed in November 1986, which was too late to be incorporated into this thesis.

The explanatory model developed in this thesis uses the LOGIT nonlinear estimation technique. This technique was chosen because the dependent variable, the physician's decision to stay or leave the Naval service in FY85, is a binary choice variable. That is, the probability of a physician leaving the Navy in FY85 is restricted to values of either Ø or 1.

The purpose of this binary choice model is to determine the probability that a physician with a given set of attributes, such as income or commissioning program, will make the decision to stay or leave the Navy. The data indicate whether a Navy physician's career decision was to stay or leave the service in FY85. In addition, we know the physician's specialty, commissioning program, age, race, gender, and a number of other personal characteristics that will influence the decision to leave. The LOGIT nonlinear technique estimates the significance of these variables on the physicians' choice to stay or leave the Navy. For example, the LOGIT models developed will indicate how important the officer's medical specialty is in the decision to stay in the military service. [Ref. 6]

A. PREVIOUS STUDIES

Two noteworthy studies utilizing the LOGIT regression estimation technique and medical officer historical data have been performed within the past two years. Daubert's

analysis focused on the retention of volunteer physicians in the U.S. Air Force using historical data from the Air Force Uniformed Officer Record (UOR), FY 1975-FY 1982. Daubert reached several conclusions regarding the retention behavior of volunteer Air Force physicians.

1. Young board certified surgeons and obstetricians, both U.S.- and foreign-trained, are least likely to be retained under current conditions and are most responsive to an increase in military pay.

2. Foreign-trained, hospital-based physicians (radiologists, anesthesiologists, pathologists) without board certification have the highest predicted retention rate.

3. Foreign-trained subspecialists and surgeons are retained at a lower rate than U.S.-trained physicians in this group (most of whom are older).

4. Volunteer retention increases with the physician's military grade; i.e., given years of training, the Air Force tends to keep older and usually more expensive volunteers. [Ref. 7]

A second LOGIT regression analysis was performed by Mullins who examined the retention behavior of Navy physicians using data obtained from the June 1983 Medical Officer File. Although constrained by deficiencies in the data, particularly missing values in several relevant fields, the following findings were obtained.

1. A physician's specialty is a key indicator of the likelihood of staying in the Navy. Psychiatrists are more likely to stay in the Navy than physicians in any other specialty. Estimation results indicate that physicians with a general medicine specialty are the most likely to leave the Navy.

2. Medical officer retention also differed across source of entry program. A physician who entered under the Early Commissioning programs or the Berry Plan had a higher probability of leaving the Navy in FY82.

3. An officer's location in the career path affects the likelihood that he or she will leave the Navy. Physicians who are eligible to retire and those who are within one year of being free of obligation are more likely to leave the Navy than physicians who are not at either of these decision points.

4. Factors that were found to decrease the likelihood of a physician leaving include being a foreign medical school graduate, holding additional medical related qualifications (e.g., flight surgeon qualified), and being a regular Navy officer. [Ref. 8]

Other studies have performed analyses on data obtained from the 1978 DOD Survey of Officers and Enlisted Personnel conducted by the Rand Corporation. These efforts utilize survey data vice actual frequency data and add much to the understanding of physician motivation because the medical officer's intentions and motives are analyzed rather than strictly objective data. A possible shortcoming of these analyses is often the lack of follow-up as to whether a physician, in this case, actually carried out his specified intentions.

Three reports were analyzed to gain insight into the Navy physicians' satisfaction and military commitment. Cain's analysis [Ref. 9] suggested that inadequate pay as compared to civilian opportunities, the frequency of permanent transfers, and negative satisfaction with military life were significant factors in the decision of medical officers to remain on active duty. Menifee [Ref. 10] similarly found that the military-civilian wage comparison was an important factor in the retention of physicians past their initial period of obligation. In addition,

the immediate supervision relationship and retirement benefits were also important to the retention decision.

A third study examined military physician procurement programs. In the FY85 Navy, approximately 81 percent of both the active medical officers and losses entered the service as a volunteer (22 percent) or through the Armed Forces Health Professions Scholarship Program (AFHPSP) (59 percent). In the Air Force, Hosek found that while the "AFHPSP program represents a more stable procurement source than direct recruiting in both numbers and composition ... it is also more expensive" [Ref. 11]. Additionally, this analysis found that FY81 U.S. Air Force AFHPSP physicians, using a five percent discount rate, are 25-30 percent more expensive than volunteers and 40 percent more expensive at an eight percent discount rate. However, if volunteers were to be paid an additional $15,000-20,000 in annual pay, this cost difference with AFHPSP would be eradicated.

B. COST OF LEAVING MODEL

The purpose of this section is to present and discuss the cost of leaving model as specified by the Center for Naval Analysis (CNA) and frequently relied on by the Navy. Although this thesis has not relied on this particular form of analysis, discussion of the model will highlight several factors relevant to a military physician's decision

to remain within or leave the Naval service not presented elsewhere. This more detailed analysis of pecuniary returns, for example, is not a subject of this thesis while personal characteristics such as commissioning program, gender and citizenship have been included.

Individual choice theory assumes that service members have full information and choose to stay in the Navy if the monetary returns, net of costs, outweigh their distaste for military life [Ref. 12]. Retention forecasts can thus be generated based on a comparison of the present value of the individual's expected civilian and military earnings streams and "taste" for military life. The military physician will remain on active duty if the expected military returns net of civilian returns are positive. The individual's rate of time preference or discount rate is used to calculate the present value of both earnings streams. Higher discount rates represent less valuable future earnings [Ref. 13].

The CNA cost of leaving model, commonly known as the Annualized Cost of Leaving (ACOL) Model is specified as:

$$C(t,n) = \left[\sum_{j=t}^{n} \frac{M(j)}{(1+r)^{j-t}} + \frac{\bar{W}(n) + \bar{R}(n)}{(1+r)^{n-t}} \right] - (W(t) + R(t));$$

where:

C(t,n) = net present value of monetary and non-monetary returns of staying in military medicine until time "n" as compared with leaving in the current period "t".

$M(j)$ = pecuniary returns to military service from period "t" through "n".

$\bar{W}(n)$ = lump-sum payment of the present value (in period "n") of the expected after-service civilian wages realized by those staying in the military until "n".

$\bar{R}(n)$ = lump-sum payment of the present value (in period "n") of the expected retirement benefits realized by those physicians staying in the military until "n".

$W(t)$ = present value in year "t" of the expected civilian wages realized by those leaving the military in year "t".

$R(t)$ = present value in year "t" of the expected civilian retirement payments for those physicians leaving the military in year "t".

r = physician's individual rate of time preference or discount rate.

[Ref. 13]

The first term in the bracket, $M(j)$, is the monetary value of total military pay discounted over time. Although direct military compensation is easily quantifiable, total military compensation includes such factors as state and federal tax advantages and discounts received from military exchanges/commissaries. As specified later, this thesis does not consider these "fringe" benefits in calculating the military pay of physicians due to the difficulty of estimating the equivalent monetary value of in-kind benefits.

The measure of returns realized once the physician stays until year "n", $\bar{R}(n) + \bar{W}(n)$, is often defined at the year of retirement (LOS = 20). The expected stream

of retirement pay is calculated and discounted to the year retirement begins. At this point, the sum is again discounted to the current period. As would be expected, even assuming an annual retirement pay for Captain physicians at year 20 in FY85 of $22,638, the projection of future retirement increases ($\bar{R}(n)$) and the discount rate chosen, involve speculative assumptions about the future status of retirement benefits, inflation, and a physician's time preference for money. The same can be said of retired military physician earnings ($\bar{W}(n)$) in addition to the fundamental difficulties of projecting whether he will even remain within medicine and to what extent. These difficulties in ascertaining the military retirement pay stream would be similar to the problems of calculating expected physician retirement flows in the private sector.

The opportunity cost foregone if the military physician remains in the military, $W(t) + R(t)$, composes the final term in the equation and represents expected civilian wages and retirment payments. As we shall see, civilian wages in this thesis are defined as median practice net or average "take-home" pay. This fiftieth percentile ignores the time value of human capital, start-up costs of establishing a practice, and work locaton. Specifically, urban physicians tend to have higher earnings than rural physicians which can again be differentiated by national geographic region. In addition, incorporated physicians

net substantially more than their nonincorporated counterparts.

The civilian-military wage differential alone does little to explain some of the difficulties encountered by physicians in the private sector. Some of the major influences on the enlisted retention decision appear equally applicable to Navy physicians: low pay, geographic instability, petty regulations, and lack of recognition [Ref. 13]. The civilian sector, however, faces a different set of difficulties such as too many competing colleagues (441,ØØØ non-military M.D.s and D.O.s), falling patient visit rates (down 21 percent between 1975 and 1985), the spread of contract medicine, tough reimbursement rules, increasing malpractice premiums (up 31 percent in 1985), and other difficulties faced in the management of a business [Ref. 14].

Aside from the problems of estimating both military and civilian earnings streams, the ACOL model does little to estimate the nonmonetary and difficult-to-quantify personal "taste" factors influencing a physician's decision to stay or leave the Navy. An example of these are policy alternatives which may generate important psychological factors which can influence a Navy physician's decision to stay or leave the military. Specifically, improvements in quality assurance programs with their accompanying increased documentation requirements, continued emphasis on medical readiness with its complementary field medicine

operations, and the ramifications of increasing physician tours aboard ships from one to two years may significantly affect a physician's taste for military life [Ref. 12]. Complicating the effect of these policy alternatives is the divergent effect one policy can have on different physicians.

To improve the theoretical model previously specified, an unobserved military taste factor must be added to the model. This taste factor is positive (may reflect job security or sense of belonging to a community) if one prefers military to civilian life, and negative if the physician has a "distaste" for military service (may reflect poor duty stations or resource shortages). Specification of taste factors in a model using the statistical methodology found in the LOGIT estimation technique, for example, and accurate measurement of the behavioral variables remains difficult and may hinder the significance and usefulness of any findings or conclusions attributed to them. Thus, this empirical task was not attempted in this thesis.

III. CHARACTERISTICS OF NAVAL MEDICAL OFFICERS

To provide a framework for better understanding retention within the Navy physician population and particularly surgeons and hospital-based doctors, all medical officers, including those who left the service in FY85 (N=492), were categorized according to individual characteristics. The variables chosen are also delineated by whether the individual decided to stay or leave (DELCD2) the Naval service in FY85. Providing a frequency analysis of each factor by physician specialty followed by a second evaluation of the variable by DELCD2 gives the reader a reference point and an overview of the data prior to estimation of the LOGIT models. Missing values, as shall be explained in detail shortly, are primarily the result of a physician having an obligation to remain in the Navy through FY85.

A. SPECIALTY

The 62 physician specialties referred to earlier were combined in this study to produce nine relatively homogeneous categories with a sufficient number of observations to accommodate analysis. Table 2 illustrates the distribution of doctors by specialty. GMOs comprise the largest category, but this can be misleading since medical students currently in training are also found within this category.

TABLE 2

PHYSICIANS BY SPECIALTY

XSUBSP1 SUBSPECIALTY ONE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
EXEC	1.	168	3.8	3.8	3.8
GMO	2.	1490	33.5	33.9	37.7
SURG	3.	408	9.2	9.3	47.0
OBGYN	4.	208	4.7	4.7	51.7
INTMED	5.	426	9.6	9.7	61.4
PEDS	6.	240	5.4	5.5	66.9
FAMPR	7.	305	6.9	6.9	73.8
HOSPB	8.	499	11.2	11.4	85.2
OTHER	9.	651	14.6	14.8	100.0
MISSING	-9.	52	1.2	MISSING	100.0
	TOTAL	4447	100.0	100.0	

VALID CASES 4395 MISSING CASES 52

Note:

EXEC is executive/managerial medical officer
GMO is a general medical officer
SURG is a surgeon
OBGYN is an obstetrician/gynecologist
INTMED is an internal medicine specialist
PEDS is a pediatrician
FAMPR is a family practitioner
HOSPB is a radiologist, anesthesiologist, pathologist
OTHER is all other physicians

B. STAY OR LEAVE

The decision to remain or leave the Naval service would be impossible to accurately analyze without some

method of determining those physicians serving on active duty under obligation. Removing obligated physicians from the sample leaves a cohort that was free to depart the service or remain on active duty in FY85. The majority of obligated service is the result of Navy-sponsored education programs such as medical school, internship, residency or fellowship training. Specifically, a physician was considered obligated and omitted from further analysis if he or she fell into the following groups:

1. Pending admission to the Naval Medical Corps.
2. Classified as obligated to serve or with a minimum service requirement past September 1985.
3. Completed internship subsequent to September 1984.
4. Entered the Navy subsequent to September 1983.
5. Completed residency subsequent to September 1983.
6. Classified as 'in training'.
7. An intern.
8. A graduate of the Uniformed Services University of the Health Sciences (USUHS).
9. Commissioned through the Armed Forces Health Professions Scholarship Program and had completed internship subsequent to September 1983. [Ref. 15]

Table 3 shows the number of non-obligated physicians who left the Naval service by specialty. When compared with Table 2, nearly 75 percent of all physicians remaining on active duty during FY85 were obligated (N=2833). Of the remaining 1525 who could have left the service, approximately 30 percent did leave. The highest percentage of

TABLE 3

PHYSICIAN SPECIALTY BY STAY OR LEAVE DECISION

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSPB	9.OTHER	ROW TOTAL
0. STAY		136	190	94	36	121	102	60	103	216	1058
		12.9	18.0	8.9	3.4	11.4	9.6	5.7	9.7	20.4	69.4
		86.6	57.9	75.8	51.4	69.5	81.0	58.3	60.9	78.8	
		8.9	12	6.2	2.4	7.9	6.7	3.9	6.8	14.2	
1. LEAVE		21	138	30	34	53	24	43	66	58	467
		4.5	29.6	6.4	7.3	11.3	5.1	9.2	14.1	12.4	30.6
		13.4	42.1	24.2	48.6	30.5	19.0	41.7	39.1	21.2	
		1.4	9.0	2.0	2.2	3.5	1.6	2.8	4.3	3.8	
COLUMN TOTAL		157	328	124	70	174	126	103	169	274	1525
		10.3	21.5	8.1	4.6	11.4	8.3	6.8	11.1	18.0	100.0

NUMBER OF MISSING OBSERVATIONS = 2922

leavers was among OBGYN (49%), GMO (42%), FAMPR (42%), and HOSPB (39%). Those specialties less likely to leave were EXEC (13%) and PEDS (19%).

C. GRADE

Physicians receive credit for purposes of promotion for time spent in medical school (4 years), an internship (1 year), residency training (year-for-year), and even civilian practice (1/2 year for each year). Since 4 years is given initially for the completion of medical school, no physician falls below the rank of lieutenant (O-3). The total creditable service cannot exceed 14 years. Those entering service with 10 to 14 years of creditable service are lieutenant commanders (O-4). Table 4 provides a force structure matrix of the physician population by

grade and physician specialty. As anticipated, the most senior medical officers are EXEC (83% CAPT or above) while the most junior officers are GMO (81% LT) with the median officer being a Lieutenant Commander. Upon removing obligated officers from this cohort in Table 5, however, the median officer who chose to remain on active duty is now

TABLE 4

PHYSICIAN SPECIALTY BY GRADE

GRADE	COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSP8	9.OTHER	ROW TOTAL
3. LT		0	1210	95	70	106	64	111	152	127	1935
		0.0	62.5	4.9	3.6	5.5	3.3	5.7	7.9	6.6	44.0
		0.0	81.3	23.3	33.8	24.9	26.7	36.4	30.5	19.5	
		0.0	27.5	2.2	1.6	2.4	1.5	2.5	3.5	2.9	
4. LCDR		6	194	190	94	191	85	156	221	275	1412
		0.4	13.7	13.5	6.7	13.5	6.0	11.0	15.7	19.5	32.1
		3.6	13.0	46.6	45.4	44.8	35.4	51.1	44.3	42.2	
		0.1	4.4	4.3	2.1	4.3	1.9	3.6	5.0	6.3	
5. CDR		22	62	64	20	86	71	34	84	138	581
		3.8	10.7	11.0	3.4	14.8	12.2	5.9	14.5	23.8	13.2
		13.1	4.2	15.7	9.7	20.2	29.6	11.1	16.8	21.2	
		0.5	1.4	1.5	0.5	2.0	1.6	0.8	1.9	3.1	
6. CAPT		125	23	59	23	42	20	4	42	111	449
		27.8	5.1	13.1	5.1	9.4	4.5	0.9	9.4	24.7	10.2
		74.4	1.5	14.5	11.1	9.9	8.3	1.3	8.4	17.1	
		2.8	0.5	1.3	0.5	1.0	0.5	0.1	1.0	2.5	
7. RADML		4	0	0	0	0	0	0	0	0	4
		100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8. RADMU		10	0	0	0	1	0	0	0	0	11
		90.9	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.3
		6.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	
		0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9. VADM		1	0	0	0	0	0	0	0	0	1
		100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL		168	1489	408	207	426	240	305	499	651	4393
		3.8	33.9	9.3	4.7	9.7	5.5	6.9	11.4	14.8	100.0

NUMBER OF MISSING OBSERVATIONS = 54

a Commander with the highest losses experienced by lieutenants (75%).

D. LENGTH-OF-SERVICE (LOS)

An officer's rank and commissioned length-of-service are generally closely correlated. As previously noted, physicians can be an exception due to creditable service time given for medical training and any civilian practice. Length-of-service is particularly meaningful, independent of grade, in measuring a physician's military experience. Appendix A displays each physician specialty by length-of-service. The calculations made at the end of this table are provided to show the percentage of medical officers who are beyond fourteen years of service and considered, for the purposes of this study, to be 'career' officers.

TABLE 5

STAY OR LEAVE DECISION BY GRADE

	COUNT / ROW PCT / COL PCT / TOT PCT	3.I	4.I	5.I	6.I	7.I	8.I	9.I	ROW TOTAL
OELCD2									
0. STAY		41	269	387	365	3	6	1	1072
	ROW PCT	3.8	25.1	36.1	34.0	0.3	0.6	0.1	68.5
	COL PCT	25.5	53.9	82.5	87.1	75.0	54.5	100.0	
	TOT PCT	2.6	17.2	24.7	23.3	0.2	0.4	0.1	
1. LEAVE		120	230	82	54	1	5	0	492
	ROW PCT	24.4	46.7	16.7	11.0	0.2	1.0	0.0	31.5
	COL PCT	74.5	46.1	17.5	12.9	25.0	45.5	0.0	
	TOT PCT	7.7	14.7	5.2	3.5	0.1	0.3	0.0	
COLUMN TOTAL		161	499	469	419	4	11	1	1564
		10.3	31.9	30.0	26.8	0.3	0.7	0.1	100.0

NUMBER OF MISSING OBSERVATIONS = 2883

Closer examination of 'career' specialists also notes several significant differences from the DOD FY85 overall continuation rate of 13 percent noted earlier. Executive medicine officers (71%) can be assumed to have attained their managerial positions later in their Naval service. The GMO's very low career percentage of two percent may indicate a strong preference for leaving the service upon completion of obligated service if further residency or specialist training is not obtained. Family practice residency training is a relatively new specialty and this suggests the reason for the low percentage (6%) of these physicians in this specialty remaining past 14 years of service. 'Career' surgeons very closely approximate the overall continuation rate for all Navy physicians.

Table 6 further separates this cohort into physicians remaining in service and those who were a loss to the Navy in FY85. As would be anticipated, obligated service is prominent through the first 10 years of service. Losses are also relatively constant through the first 10 years of service, drop to about 10 physicians per year until year 15, become almost nonexistent until year 20 and then rise as the physician becomes eligible to retire. The peak losses for the active, non-obligated physician cohort appears to occur at the seventh and eighth year of service suggesting the time when AFHPSP physicians have completed medical school, internship and obligated service time.

TABLE 6

STAY OR LEAVE DECISION BY LENGTH-OF-SERVICE

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	10.1	ROW TOTAL
0. STAY	1	0	2	32	50	46	49	77	81	73	76	1071
	1	0.0	0.2	3.0	4.7	4.3	4.6	7.2	7.6	6.8	7.1	68.7
	I	0.0	5.4	37.6	57.5	51.1	54.4	63.6	62.8	69.5	80.9	
	I	0.0	0.1	2.1	3.2	2.9	3.1	4.9	5.2	4.7	4.9	
1. LEAVE	I	23	35	53	37	44	41	44	48	32	18	489
	1	4.7	7.2	10.8	7.6	9.0	8.4	9.0	9.8	6.5	3.7	31.3
	1	100.0	94	62.4	42.5	48.9	45.6	36.4	37.2	30.5	19.1	
	1	1.5	2.2	3.4	2.4	2.8	2.6	2.8	3.1	2.1	1.2	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	11.1	12.1	13.1	14.1	15.1	16.1	17.1	18.1	19.1	20.1	ROW TOTAL
0. STAY	1	60	28	53	64	51	51	49	38	45	29	1071
	1	5.6	2.6	4.9	6.0	4.8	4.8	4.6	3.5	4.2	2.7	68.7
	1	82.2	71.8	86.9	82.1	94.4	92.7	98.0	97.4	95.7	72.5	
	I	3.8	1.8	3.4	4.1	3.3	3.3	3.1	2.4	2.9	1.9	
1. LEAVE	I	13	11	8	14	3	4	1	1	2	11	489
	I	2.7	2.2	1.6	2.9	0.6	0.8	0.2	0.2	0.4	2.2	31.3
	I	17.8	28.2	13.1	17.9	5.6	7.3	2.0	2.6	4.3	27.5	
	I	0.8	0.7	0.5	0.9	0.2	0.3	0.1	0.1	0.1	0.7	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	21.1	22.1	23.1	24.1	25.1	26.1	27.1	28.1	29.1	30.1	ROW TOTAL
0. STAY	1	22	15	15	11	11	10	14	7	4	5	1071
	I	2.1	1.4	1.4	1.0	1.0	0.9	1.3	0.7	0.4	0.5	68.7
	1	61.1	71.4	75.0	91.7	84.6	76.9	73.7	70.0	66.7	83.3	
	I	1.4	1.0	1.0	0.7	0.7	0.6	0.9	0.4	0.3	0.3	
1. LEAVE	I	14	6	5	1	2	3	5	3	2	1	489
	I	2.9	1.2	1.0	0.2	0.4	0.6	1.0	0.6	0.4	0.2	31.3
	1	38.9	28.6	25.0	8.3	15.4	23.1	26.3	30.0	33.3	16.7	
	I	0.9	0.4	0.3	0.1	0.1	0.2	0.3	0.2	0.1	0.1	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	31.1	32.1	33.1	38.1	39.1	ROW TOTAL
							19 / 1.2	10 / 0.6	6 / 0.4	6 / 0.4	1560 / 100.0
0. STAY	1	1	0	0	1	1	1071
	I	0.1	0.0	0.0	0.1	0.1	68.7
	1	33.3	0.0	0.0	100.0	100.0	
	I	0.1	0.0	0.0	0.1	0.1	
1. LEAVE	I	2	I	1	0	0	489
	I	0.4	0.2	0.2	0.0	0.0	31.3
	I	66.7	100.0	100.0	0.0	0.0	
	I	0.1	0.1	0.1	0.0	0.0	
COLUMN TOTAL		3 / 0.2	1 / 0.1	1 / 0.1	I / 0.1	1 / 0.1	1560 / 100.0

NUMBER OF MISSING OBSERVATIONS = 2887

TABLE 7

PHYSICIAN SPECIALTY BY ELIGIBLE TO RETIRE

	COUNT / ROW PCT / COL PCT / TOT PCT	EXEC	GMO 1.1	SURG 2.1	OBGYN 3.1	INTMED 4.1	PEDS 5.1	FAMPR 6.1	HOSPS 7.1	OTHER 8.1	9.1	ROW TOTAL
ELRET												
0.		100	1473	386	193	406	232	302	480	613		4185
NOTELRET		2.4	35.2	9.2	4.6	9.7	5.5	7.2	11.5	14.6		95.6
		59.5	99.4	94.8	92.8	95.5	96.7	100.0	96.8	94.5		
		2.3	33.7	8.8	4.4	9.3	5.3	6.9	11.0	14.0		
1.		68	9	21	15	19	8	0	16	36		192
ELRET		35.4	4.7	10.9	7.8	9.9	4.2	0.0	8.3	18.8		4.4
		40.5	0.6	5.2	7.2	4.5	3.3	0.0	3.2	5.5		
		1.6	0.2	0.5	0.3	0.4	0.2	0.0	0.4	0.8		
COLUMN TOTAL		168	1482	407	208	425	240	302	496	649		4377
		3.8	33.9	9.3	4.8	9.7	5.5	6.9	11.3	14.8		100.0

NUMBER OF MISSING OBSERVATIONS = 70

E. ELIGIBLE TO RETIRE (ELRET)

A different perspective with which to view length-of-service is whether an officer is eligible to retire or not. Active Duty Base Date (ADBD) was used to make this determination as it was for length-of-service. Active duty base date contained 281 missing values and was augmented by data from the following data fields: Active Commission Base Date (ACBD), Professional Service Date (PSD), Date of First Naval Commission (DFNC), Health Professional Pay Entry Date (HPPED), and Pay Entry Base Date (PEBD), to form a new variable with 18 missing values. Table 7 separates by specialty those medical officers who have served twenty years and are eligible to retire from those physicians who have not. As previously stated, medical officers who have become administrators are likely to

TABLE 8

STAY OR LEAVE DECISION BY ELIGIBLE TO RETIRE

DELCD2		NOTELRET (0.)	ELRET (1.)	ROW TOTAL
STAY	COUNT	937	134	1071
	ROW PCT	87.5	12.5	68.7
	COL PCT	68.3	70.9	
	TOT PCT	60.1	8.6	
LEAVE	COUNT	434	55	489
	ROW PCT	88.8	11.2	31.3
	COL PCT	31.7	29.1	
	TOT PCT	27.8	3.5	
COLUMN TOTAL		1371	189	1560
		87.9	12.1	100.0

NUMBER OF MISSING OBSERVATIONS = 2887

accomplish this transition later in their military careers. Table 8 shows that 29 percent of those officers eligible to retire in FY85 did so, but this was slightly fewer leavers than among those officers who were not eligible to retire (32%). Finally, combining data from the previous two tables shows that approximately three percent of all remaining physicians in FY85 were eligible to retire.

F. AGE

Complementing GRADE, Length-of-Service and ELRET is a physician's age. Appendix B shows a physician's age by specialty and again indicates that GMOs tend to be younger medical officers while EXECs tend to be more mature. A surgeons median age is 35. While the median age for all physicians is 33, Table 9 shows the median age for

TABLE 9

STAY OR LEAVE DECISION BY AGE

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	ROW TOTAL
0. STAY	COUNT	0	0	0	7	9	17	25	29	29	42	1063
	ROW PCT	0.0	0.0	0.0	0.7	0.8	1.6	2.4	2.7	2.7	4.0	68.6
	COL PCT	0.0	0.0	0.0	29.2	56.3	32.7	37.9	43.3	41.4	50.6	
	TOT PCT	0.0	0.0	0.0	0.5	0.6	1.1	1.6	1.9	1.9	2.7	
1. LEAVE	COUNT	2	13	9	17	7	35	41	38	41	41	487
	ROW PCT	0.4	2.7	1.8	3.5	1.4	7.2	8.4	7.8	8.4	8.4	31.4
	COL PCT	100.0	100.0	100.0	70.8	43.8	67.3	62.1	56.7	58.6	49.4	
	TOT PCT	0.1	0.8	0.6	1.1	0.5	2.3	2.6	2.5	2.6	2.6	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	36.	37.	38.	39.	40.	41.	42.	43.	44.	45.	ROW TOTAL
0. STAY	COUNT	42	51	46	55	53	67	72	57	58	64	1063
	ROW PCT	4.0	4.8	4.3	5.2	5.0	6.3	6.8	5.4	5.5	6.0	68.6
	COL PCT	51.2	72.9	74.2	76.4	79.1	83.8	90.0	89.1	93.5	84.2	
	TOT PCT	2.7	3.3	3.0	3.5	3.4	4.3	4.6	3.7	3.7	4.1	
1. LEAVE	COUNT	40	19	16	17	14	13	8	7	4	12	487
	ROW PCT	8.2	3.9	3.3	3.5	2.9	2.7	1.6	1.4	0.8	2.5	31.4
	COL PCT	48.8	27.1	25.8	23.6	20.9	16.3	10.0	10.9	6.5	15.8	
	TOT PCT	2.6	1.2	1.0	1.1	0.9	0.8	0.5	0.5	0.3	0.8	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	46.	47.	48.	49.	50.	51.	52.	53.	54.	55.	ROW TOTAL
0. STAY	COUNT	48	43	33	36	36	20	28	15	22	13	1063
	ROW PCT	4.5	4.0	3.1	3.4	3.4	1.9	2.6	1.4	2.1	1.2	68.6
	COL PCT	82.8	86.0	91.7	78.3	80.0	69.0	93.3	75.0	84.6	81.3	
	TOT PCT	3.1	2.8	2.1	2.3	2.3	1.3	1.8	1.0	1.4	0.8	
1. LEAVE	COUNT	10	7	3	10	9	9	2	5	4	3	487
	ROW PCT	2.1	1.4	0.6	2.1	1.8	1.8	0.4	1.0	0.8	0.6	31.4
	COL PCT	17.2	14.0	8.3	21.7	20.0	31.0	6.7	25.0	15.4	18.8	
	TOT PCT	0.6	0.5	0.2	0.6	0.6	0.6	0.1	0.3	0.3	0.2	

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	56.	57.	58.	59.	60.	61.	62.	64.	65.	67.	ROW TOTAL
0. STAY	COUNT	9	9	9	8	3	5	1	0	1	1	1063
	ROW PCT	0.8	0.8	0.8	0.8	0.3	0.5	0.1	0.0	0.1	0.1	68.6
	COL PCT	60.0	60.0	75.0	57.1	50.0	71.4	25.0	0.0	50.0	100.0	
	TOT PCT	0.6	0.6	0.6	0.5	0.2	0.3	0.1	0.0	0.1	0.1	
1. LEAVE	COUNT	6	6	3	6	3	2	3	1	1	0	487
	ROW PCT	1.2	1.2	0.6	1.2	0.6	0.4	0.6	0.2	0.2	0.0	31.4
	COL PCT	40.0	40.0	25.0	42.9	50.0	28.6	75.0	100.0	50.0	0.0	
	TOT PCT	0.4	0.4	0.2	0.4	0.2	0.1	0.2	0.1	0.1	0.0	
COLUMN TOTAL		15	15	12	14	6	7	4	1	2	1	1550
		1.0	1.0	0.8	0.9	0.4	0.5	0.3	0.1	0.1	0.1	100.0

NUMBER OF MISSING OBSERVATIONS = 2897

leavers to be 35 and the median age for non-obligated physicians remaining on active duty to be 42.

G. SOURCE OF ENTRY (SOE)

Most medical officers are commissioned through one of several programs unique to the medical community. Some of these programs are relatively new (eg. the Uniformed Services University of the Health Sciences (USUHS) and the Armed Forces Health Profession Scholarship Program (AFHPSP) initiated in 1972 and 1976, respectively. Others, such as the Berry Plan (BP) and the Medical/Osteopathic Scholarship Program (MOSP) were terminated in 1973 and 1977, respectively [Ref. 15]. Volunteers (VOL), the Early Commissioning Program (ECP), miscellaneous medical officer accessions, and interservice transfers comprise the remainder.

Table 10 depicts the FY85 physician community inventory by source of entry and physician specialty with PRIOR representing those physicians who entered the Navy via the BP (110), ECP (285) or MOSP (223). As shown, almost 85 percent of the losses and continuances for FY85 entered the Naval service via the AFHPSP or were volunteers. In addition, GMOs, which again includes physicians in medical school and internship, composed nearly 81 percent of AFHPSP. The newness of the USUHS and its potential as a future source of physicians is an area to be covered

TABLE 10

PHYSICIAN SPECIALTY BY SOURCE OF ENTRY

XSOE28		EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPS	OTHER	ROW TOTAL
		1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	
VOL	1.	66	217	122	37	102	67	43	132	198	984
		6.7	22.1	12.4	3.8	10.4	6.8	4.4	13.4	20.1	23.5
		40.5	15.9	30.7	18.3	24.2	28.9	14.5	27.0	31.5	
		1.6	5.2	2.9	0.9	2.4	1.6	1.0	3.1	4.7	
PRIOR	2.	91	43	74	34	69	54	35	71	138	609
		14.9	7.1	12.2	5.6	11.3	8.9	5.7	11.7	22.7	14.5
		55.8	3.1	18.6	16.8	16.4	23.3	11.8	14.5	22.0	
		2.2	1.0	1.8	0.8	1.6	1.3	0.8	1.7	3.3	
AFHPSP	3.	6	1106	202	131	250	111	218	285	292	2601
		0.2	42.5	7.8	5.0	9.6	4.3	8.4	11.0	11.2	62.0
		3.7	81.0	50.8	64.9	59.4	47.8	73.6	58.4	46.5	
		0.1	26.4	4.8	3.1	6.0	2.6	5.2	6.8	7.0	
	COLUMN TOTAL	163	1366	398	202	421	232	296	488	628	4194
		3.9	32.6	9.5	4.8	10.0	5.5	7.1	11.6	15.0	100.0

NUMBER OF MISSING OBSERVATIONS = 258

TABLE 11

STAY OR LEAVE BY SOURCE OF ENTRY

DELCD2		VOL	PRIOR	AFHPSP	ROW TOTAL
		1.1	2.1	3.1	
STAY	0.	460	391	198	1049
		43.9	37.3	18.9	68.2
		74.8	84.8	43.0	
		29.9	25.4	12.9	
LEAVE	1.	155	70	263	488
		31.8	14.3	53.9	31.8
		25.2	15.2	57.0	
		10.1	4.6	17.1	
	COLUMN TOTAL	615	461	461	1537
		40.0	30.0	30.0	100.0

NUMBER OF MISSING OBSERVATIONS = 2910

in subsequent research as these officers begin to complete their obligated service. Of the 223 missing values noted, 170 are USUHS students or graduates, all of whom were

obligated in FY85. Additionally, miscellaneous officer accessions and transfers were omitted due to the small size of this cohort (30).

Table 11 reveals that by far the largest percent of leavers occurred within AFHPSP (57%) followed by volunteers (25%). Conversely, PRIOR medical officers were the most likely to stay (85%). Although many PRIOR (Berry Plan) physicians were originally draft motivated and less inclined to become career officers, separate frequency analysis indicates those who did remain now appear much less likely to leave. This is shown in Table 12 and is a change from the behavior of 1982 Berry Plan physicians noted earlier in Mullin's research [Ref. 8].

TABLE 12

STAY OR LEAVE BY SOURCE OF ENTRY WITH BP, ECP, MOSP

	COUNT / ROW PCT / COL PCT / TOT PCT	VOL (1.)	ECP (2.)	BP (3.)	MISC (4.)	AFHPSP (5.)	MOSP (6.)	ROW TOTAL
DELCD2								
STAY (0.)		460	209	97	22	198	85	1071
		43.0	19.5	9.1	2.1	18.5	7.9	68.7
		74.8	83.6	92.4	95.7	43.0	80.2	
		29.5	13.4	6.2	1.4	12.7	5.4	
LEAVE (1.)		155	41	8	1	263	21	489
		31.7	8.4	1.6	0.2	53.8	4.3	31.3
		25.2	16.4	7.6	4.3	57.0	19.8	
		9.9	2.6	0.5	0.1	16.9	1.3	
COLUMN TOTAL		615	250	105	23	461	106	1560
		39.4	16.0	6.7	1.5	29.6	6.8	100.0

NUMBER OF MISSING OBSERVATIONS = 2887

TABLE 13

PHYSICIAN SPECIALTY BY SUBSPECIALTY CODE (BDCERT)

XSUBC1	COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1	GMO 2	SURG 3	OBGYN 4	INTMED 5	PEDS 6	FAMPR 7	HOSPB 8	OTHER 9	ROW TOTAL
1. FULLY TRAINED		0	1157	115	90	93	79	93	168	168	1963
		0.0	58.9	5.9	4.6	4.7	4.0	4.7	8.6	8.6	44.7
		0.0	77.7	28.2	43.3	21.8	32.9	30.5	33.7	25.8	
		0.0	26.3	2.6	2.0	2.1	1.8	2.1	3.8	3.8	
2. BOARD CERT		132	46	170	59	256	126	134	206	306	1435
		9.2	3.2	11.8	4.1	17.8	8.8	9.3	14.4	21.3	32.7
		78.6	3.1	41.7	28.4	60.1	52.5	43.9	41.3	47.0	
		3.0	1.0	3.9	1.3	5.8	2.9	3.0	4.7	7.0	
3. SIGEXP		35	0	0	0	0	0	0	0	14	49
		71.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	1.1
		20.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	
		0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
4. IN TRAINING		1	287	123	59	77	35	78	125	163	948
		0.1	30.3	13.0	6.2	8.1	3.7	8.2	13.2	17.2	21.6
		0.6	19.3	30.1	28.4	18.1	14.6	25.6	25.1	25.0	
		0.0	6.5	2.8	1.3	1.8	0.8	1.8	2.8	3.7	
COLUMN TOTAL		168	1490	408	208	426	240	305	499	651	4395
		3.8	33.9	9.3	4.7	9.7	5.5	6.9	11.4	14.8	100.0

NUMBER OF MISSING OBSERVATIONS = 52

H. SUBSPECIALTY CODE/BOARD CERTIFICATION (BDCERT)

In addition to specialty, each physician is classified as to his status within his field. Primarily, a physician is in training (22%), fully trained and not board certified in his selected specialty (45%), or board certified (33%). The remainder of physicians are in executive medicine or OTHER specialty (1%). The training category is one of the primary determinants of whether a physician was "obligated" and hence not eligible to leave the service under usual circumstances. Table 13 provides a crosstabulation of each physician specialty by training status and level of expertise. Noteworthy is the larger number

TABLE 14

STAY OR LEAVE DECISION BY SUBSPECIALTY CODE (BDCERT)

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	FULLY TRAINED 1.I	BOARD CERT 2.I	SIGEXP 3.I	IN TRAINING 4.I	ROW TOTAL
STAY	0.	343	696	33	0	1072
		32.0	64.9	3.1	0.0	68.5
		58.8	75.4	78.6	0.0	
		21.9	44.5	2.1	0.0	
LEAVE	1.	240	227	9	16	492
		48.8	46.1	1.8	3.3	31.5
		41.2	24.6	21.4	100.0	
		15.3	14.5	0.6	1.0	
COLUMN TOTAL		583 / 37.3	923 / 59.0	42 / 2.7	16 / 1.0	1564 / 100.0

NUMBER OF MISSING OBSERVATIONS = 2883

of board certified physicians in the Navy (33%) than Daubert found in the Air Force (26%) [Ref. 7]. The largest numbers of board certified physicians are found in OTHER (306), HOSPB (206) and SURG (170). In addition, 79 percent of executive medicine officers are board certified specialists. Subspecialty code is a combination of subspecialty code data field one and two on the Medical Officer File. In FY85, this suggests the number of board certified physicians serving in their "primary" or first subspecialty was 974. With the 'in training' category considered to be obligated, Table 14 indicates that 41 percent of fully trained physicians that could leave the Navy did so while only 25 percent of board certified physicians departed from the Navy in FY85. This is contrary to expectations. Board certified physicians might be anticipated to leave

TABLE 15

PHYSICIAN SPECIALTY BY ADDITIONAL QUALIFICATIONS

XADQ1	COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSP8	9.OTHER	ROW TOTAL
0. UNDERSEA		21	84	7	2	11	1	9	15	42	192
		10.9	43.8	3.6	1.0	5.7	0.5	4.7	7.8	21.9	12.6
		22.3	14.8	5.3	5.1	8.8	2.0	7.9	10.0	16.5	
		1.4	5.5	0.5	0.1	0.7	0.1	0.6	1.0	2.7	
1. FLIGHT		43	323	34	7	24	4	16	54	116	621
		6.9	52.0	5.5	1.1	3.9	0.6	2.6	8.7	18.7	40.6
		45.7	56.9	25.6	17.9	19.2	8.0	14.0	36.0	45.5	
		2.8	21.1	2.2	0.5	1.6	0.3	1.0	3.5	7.6	
2. OTHER		30	161	92	30	90	45	89	81	97	715
		4.2	22.5	12.9	4.2	12.6	6.3	12.4	11.3	13.6	46.8
		31.9	28.3	69.2	76.9	72.0	90.0	78.1	54.0	38.0	
		2.0	10.5	6.0	2.0	5.9	2.9	5.8	5.3	6.3	
COLUMN TOTAL		94	568	133	39	125	50	114	150	255	1528
		6.2	37.2	8.7	2.6	8.2	3.3	7.5	9.8	16.7	100.0

NUMBER OF MISSING OBSERVATIONS = 2919

the Naval service more frequently because of their increased earnings potential (an additional one-third net) within the private sector [Ref. 16].

I. ADDITIONAL QUALIFICATIONS

A physician may volunteer or be directed to receive additional medical training in combat medicine or other military-specific areas. For example, medical officers may receive special training in aviation or undersea medicine. Table 15 indicates the frequency with which various physician specialties have received additional qualifications. As shown, of 1528 additionally qualified medical officers, 40 percent of physicians were trained in aviation

TABLE 16

STAY OR LEAVE DECISION BY ADDITIONAL QUALIFICATIONS

	COUNT / ROW PCT / COL PCT / TOT PCT	UNDERSEA 0.	FLIGHT 1.	OTHER 2.	ROW TOTAL
DELCD2					
STAY	0.	71	216	168	455
		15.6	47.5	36.9	77.2
		77.2	78.8	75.3	
		12.1	36.7	28.5	
LEAVE	1.	21	58	55	134
		15.7	43.3	41.0	22.8
		22.8	21.2	24.7	
		3.6	9.8	9.3	
COLUMN TOTAL		92 / 15.6	274 / 46.5	223 / 37.9	589 / 100.0

NUMBER OF MISSING OBSERVATIONS = 3858

(FLIGHT) medicine (Naval aviator, flight surgeon or aviation medicine) while 13 percent received undersea medicine training (undersea medicine or saturation diving) by the end of FY85. The OTHER category primarily includes advanced cardiac life support training and the combat casualty care course (C4). Physicians who have not received any military-specific training or were obligated compose the bulk of values (2919). As noted in Table 16, only 589 non-obligated physicians have received additional qualifications, of which 48 percent involve aviation medicine.

J. REGULAR OR RESERVE

Most physicians enter the Naval service as a reserve officer on active duty. Two years after the completion

TABLE 17

PHYSICIAN SPECIALTY BY REGULAR OR RESERVE

XDESIG4	COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSPB	9.OTHER	ROW TOTAL
0. RESERV		13	1222	284	151	269	113	197	332	303	2884
		0.5	42.4	9.8	5.2	9.3	3.9	6.8	11.5	10.5	65.6
		7.7	82.0	69.6	72.6	63.1	47.1	64.6	66.5	46.5	
		0.3	27.8	6.5	3.4	6.1	2.6	4.5	7.6	6.9	
1. REGULAR		155	268	124	57	157	127	108	167	348	1511
		10.3	17.7	8.2	3.8	10.4	8.4	7.1	11.1	23.0	34.4
		92.3	18.0	30.4	27.4	36.9	52.9	35.4	33.5	53.5	
		3.5	6.1	-2.8	1.3	3.6	2.9	2.5	3.8	7.9	
COLUMN TOTAL		168	1490	408	208	426	240	305	499	651	4395
		3.8	33.9	9.3	4.7	9.7	5.5	6.9	11.4	14.8	100.0

NUMBER OF MISSING OBSERVATIONS = 52

of an internship, a physician may apply for augmentation into the regular Navy. Acceptance into the regular Navy involves a two year commitment and is therefore indicative that an officer intends to remain in the service for at least those several years. Unfortunately, the author could not devise a method to remove those physicians obligated by augmentation from the sample.

Table 17 shows that two-thirds of Navy physicians (again, active and losses combined) are reserve officers. As previously discussed, the typically more senior executive medicine officers are regular Navy (REGULAR) while the usually younger and junior GMOs are USNR (RESERVE). In removing obligated physicians, Table 18 displays that 60 percent of reserve officers left the Navy while a much

TABLE 18

STAY OR LEAVE DECISION BY REGULAR OR RESERVE

	COUNT / ROW PCT / COL PCT / TOT PCT	RESERV 0.	REGULAR 1.	ROW TOTAL
DELCD2				
STAY	0.	248	824	1072
		23.1	76.9	68.5
		39.9	87.5	
		15.9	52.7	
LEAVE	1.	374	118	492
		76.0	24.0	31.5
		60.1	12.5	
		23.9	7.5	
	COLUMN TOTAL	622 39.8	942 60.2	1564 100.0

NUMBER OF MISSING OBSERVATIONS = 2883

smaller 13 percent of regular Naval officers decided to leave in FY85.

K. FOREIGN OR U.S. MEDICAL SCHOOL GRADUATE

The medical school a military officer attends may have a bearing on his decision to continue in the Navy. Foreign medical graduates (FMGRAD) generally have lower civilian earning potential than their U.S. educated peers (USGRAD). Consequently, earlier studies have shown that foreign medical graduates tend to remain in the military longer. Table 19 depicts the percent of foreign and U.S. educated Naval physicians in FY85. As shown, 94 percent of Navy physicians are U.S. educated and this level appears consistent across all specialties. Foreign medical graduates appear concentrated among the GMO (24%), HOSPB (19%) and

TABLE 19

PHYSICIAN SPECIALTY BY U.S. OR FOREIGN MEDICAL SCHOOL

EDCOL46	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPB	OTHER	ROW TOTAL
	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	
0. FOREIGN MED GRAD	10	64	17	13	30	27	9	50	48	268
	3.7	23.9	6.3	4.9	11.2	10.1	3.4	18.7	17.9	6.3
	6.0	4.5	4.3	6.3	7.1	11.4	3.0	10.2	7.4	
	0.2	1.5	0.4	0.3	0.7	0.6	0.2	1.2	1.1	
1. U.S. MED GRAD	158	1347	381	192	391	209	294	439	598	4009
	3.9	33.6	9.5	4.8	9.8	5.2	7.3	11.0	14.9	93.7
	94.0	95.5	95.7	93.7	92.9	88.6	97.0	89.8	92.6	
	3.7	31.5	8.9	4.5	9.1	4.9	6.9	10.3	14.0	
COLUMN TOTAL	168	1411	398	205	421	236	303	489	646	4277
	3.9	33.0	9.3	4.8	9.8	5.5	7.1	11.4	15.1	100.0

NUMBER OF MISSING OBSERVATIONS = 170

TABLE 20

STAY OR LEAVE DECISION BY U.S. OR FOREIGN MEDICAL SCHOOL

DELCD2	FOREIGN MED GRAD	U.S. MED GRAD	ROW TOTAL
	0.	1.	
0. STAY	172	891	1063
	16.2	83.8	68.6
	81.1	66.6	
	11.1	57.5	
1. LEAVE	40	446	486
	8.2	91.8	31.4
	18.9	33.4	
	2.6	28.8	
COLUMN TOTAL	212	1337	1549
	13.7	86.3	100.0

NUMBER OF MISSING OBSERVATIONS = 2898

OTHER (18%) categories with little representation among FAMPR (3%) and EXEC (4%). Removing obligated physicians from the frequency sample in Table 20, however, reveals that 33 percent of U.S. medical school graduates left

the service while only 19 percent of foreign educated medical officers left.

L. CITIZENSHIP

Complementing the foreign medical school frequency variable is whether a medical officer is a U.S citizen (USCIT) or not. For this analysis, naturalized citizens and aliens were grouped together to obtain the non-citizen variable (NOTCIT). With minor numerical changes, non-citizen frequencies presented in Tables 21 and 22 mirrored those of foreign medical graduates. This would be expected since foreign medical graduates are more likely to be non-citizens.

TABLE 21

PHYSICIAN SPECIALTY BY CITIZENSHIP

		EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPS	OTHER	ROW TOTAL
		1.	2.	3.	4.	5.	6.	7.	8.	9.	
USCIT65											
0.	COUNT	3	55	20	10	25	29	9	47	52	250
NOTCIT	ROW PCT	1.2	22.0	8.0	4.0	10.0	11.6	3.6	18.8	20.8	5.7
	COL PCT	1.8	3.8	5.0	4.9	6.0	12.1	3.0	9.5	8.0	
	TOT PCT	0.1	1.3	0.5	0.2	0.6	0.7	0.2	1.1	1.2	
1.	COUNT	165	1410	384	195	395	211	295	447	597	4099
USCIT	ROW PCT	4.0	34.4	9.4	4.8	9.6	5.1	7.2	10.9	14.6	94.3
	COL PCT	98.2	96.2	95.0	95.1	94.0	87.9	97.0	90.5	92.0	
	TOT PCT	3.8	32.4	8.8	4.5	9.1	4.9	6.8	10.3	13.7	
COLUMN TOTAL		168	1465	404	205	420	240	304	494	649	4349
		3.9	33.7	9.3	4.7	9.7	5.5	7.0	11.4	14.9	100.0

NUMBER OF MISSING OBSERVATIONS = 98

TABLE 22

STAY OR LEAVE DECISION BY CITIZENSHIP

	COUNT I			
	ROW PCT I	NOTCIT	USCIT	ROW
	COL PCT I			TOTAL
	TOT PCT I	0.I	I.I	
DELCD2	--------I--------I--------I			
	0. I	144 I	923 I	1067
STAY	I	13.5 I	86.5 I	68.5
	I	77.8 I	67.2 I	
	I	9.2 I	59.2 I	
	-I--------I--------I			
	I. I	41 I	450 I	491
LEAVE	I	8.4 I	91.6 I	31.5
	I	22.2 I	32.8 I	
	I	2.6 I	28.9 I	
	-I--------I--------I			
	COLUMN	185	1373	1558
	TOTAL	11.9	88.1	100.0

NUMBER OF MISSING OBSERVATIONS = 2889

M. RACE, GENDER

Race and gender have been significant in many previous studies of reenlistment behavior. Table 23 shows that 75 percent of Navy Physicians are caucasian (CAUC) while Table 24 illustrates that 89 percent are male (MALE). With regard to race, nearly 97 percent of executive medicine, 85 percent of surgeons and 88 percent of OTHER are caucasian. Conversely, the largest number of non-caucasians (NOCAUC) are GMOs (40%) which is nearly double the percent found in the other categories. Examining gender, female physicians appear inclined to be GMOs (37%), but when compared with males, represent 23 percent of all pediatricians and 18 percent of OBGYN. Removing obligated physicians and missing values from the sample in Tables 25 and 26 reveals that nearly an equal percentage of

TABLE 23

PHYSICIAN SPECIALTY BY RACE

	COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1.1	GMO 2.1	SURG 3.1	OBGYN 4.1	INTMED 5.1	PEDS 6.1	FAMPR 7.1	HOSPB 8.1	OTHER 9.1	ROW TOTAL
XRACE63											
0. NONCAUC		5	577	59	49	86	49	50	107	79	1061
		0.5	54.4	5.6	4.6	8.1	4.6	4.7	10.1	7.4	24.9
		3.0	39.9	15.0	24.6	20.8	21.2	16.8	22.2	12.4	
		0.1	13.5	1.4	1.1	2.0	1.1	1.2	2.5	1.9	
1. CAUC		162	870	335	150	327	182	247	374	557	3204
		5.1	27.2	10.5	4.7	10.2	5.7	7.7	11.7	17.4	75.1
		97.0	60.1	85.0	75.4	79.2	78.8	83.2	77.8	87.6	
		3.8	20.4	7.9	3.5	7.7	4.3	5.8	8.8	13.1	
COLUMN TOTAL		167	1447	394	199	413	231	297	481	636	4265
		3.9	33.9	9.2	4.7	9.7	5.4	7.0	11.3	14.9	100.0

NUMBER OF MISSING OBSERVATIONS = 182

TABLE 24

PHYSICIAN SPECIALTY BY GENDER

	COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1.1	GMO 2.1	SURG 3.1	OBGYN 4.1	INTMED 5.1	PEDS 6.1	FAMPR 7.1	HOSPB 8.1	OTHER 9.1	ROW TOTAL
XSEX62											
0. FEMALE		3	181	25	38	47	54	31	59	51	489
		0.6	37.0	5.1	7.8	9.6	11.0	6.3	12.1	10.4	11.2
		1.8	12.2	6.1	18.3	11.0	22.5	10.2	11.9	7.9	
		0.1	4.1	0.6	0.9	1.1	1.2	0.7	1.3	1.2	
1. MALE		165	1302	382	170	379	186	272	438	598	3892
		4.2	33.5	9.8	4.4	9.7	4.8	7.0	11.3	15.4	88.8
		98.2	87.8	93.9	81.7	89.0	77.5	89.8	88.1	92.1	
		3.8	29.7	8.7	3.9	8.7	4.2	6.2	10.0	13.6	
COLUMN TOTAL		168	1483	407	208	426	240	303	497	649	4381
		3.8	33.9	9.3	4.7	9.7	5.5	6.9	11.3	14.8	100.0

NUMBER OF MISSING OBSERVATIONS = 66

TABLE 25

STAY OR LEAVE DECISION BY RACE

	COUNT / ROW PCT / COL PCT / TOT PCT	NONCAUC	CAUC	ROW TOTAL
		0.	1.	
DELCD2				
0. STAY		132	920	1052
	ROW PCT	12.5	87.5	69.1
	COL PCT	66.7	69.4	
	TOT PCT	8.7	60.4	
1. LEAVE		66	405	471
	ROW PCT	14.0	86.0	30.9
	COL PCT	33.3	30.6	
	TOT PCT	4.3	26.6	
COLUMN TOTAL		198	1325	1523
		13.0	87.0	100.0

NUMBER OF MISSING OBSERVATIONS = 2924

TABLE 26

STAY OR LEAVE DECISION BY GENDER

	COUNT / ROW PCT / COL PCT / TOT PCT	FEMALE	MALE	ROW TOTAL
		0.	1.	
DELCD2				
0. STAY		86	986	1072
	ROW PCT	8.0	92.0	68.6
	COL PCT	63.2	69.1	
	TOT PCT	5.5	63.1	
1. LEAVE		50	440	490
	ROW PCT	10.2	89.8	31.4
	COL PCT	36.8	30.9	
	TOT PCT	3.2	28.2	
COLUMN TOTAL		136	1426	1562
		8.7	91.3	100.0

NUMBER OF MISSING OBSERVATIONS = 2885

caucasians (31%) and non-caucasians (33%) departed the Naval service in FY85. Similarly, 37 percent of females (FEMALE) and 31 percent of males left Navy medicine.

TABLE 27

PHYSICIAN SPECIALTY BY MARITAL STATUS

	COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1.I	G'.G 2.I	SURG 3.I	OBGYN 4.I	INTMED 5.I	PEDS 6.I	FAMPR 7.I	HOSPS 8.I	OTHER 9.I	ROW TOTAL
MST64											
0. SINGLE		21	752	151	57	169	79	96	203	221	1749
		1.2	43.0	8.6	3.3	9.7	4.5	5.5	11.6	12.6	41.6
		12.7	53.3	38.5	28.9	41.4	34.3	32.5	43.3	34.8	
		0.5	17.9	3.6	1.4	4.0	1.9	2.3	4.8	5.3	
1. MARRIED		141	650	238	139	235	148	196	259	408	2414
		5.8	26.9	9.9	5.8	9.7	6.1	8.1	10.7	16.9	57.4
		85.5	46.0	60.7	70.6	57.6	64.3	66.4	55.2	64.3	
		3.4	15.5	5.7	3.3	5.6	3.5	4.7	6.2	9.7	
2. NEW SINGLE		3	10	3	1	4	3	3	7	6	40
		7.5	25.0	7.5	2.5	10.0	7.5	7.5	17.5	15.0	1.0
		1.8	0.7	0.8	0.5	1.0	1.3	1.0	1.5	0.9	
		0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.1	
COLUMN TOTAL		165	1412	392	197	408	230	295	469	635	4203
		3.9	33.6	9.3	4.7	9.7	5.5	7.0	11.2	15.1	100.0

NUMBER OF MISSING OBSERVATIONS = 244

N. MARITAL STATUS

A physician's marital status may influence his decision to remain in the Navy. MARRIED officers may be more risk adverse than SINGLE officers when deciding to depart the Navy for a civilian medical practice due to financial concerns surrounding family commitments. The category 'new single' shown in Table 27 contains those individuals divorced, widowed or separated. For purposes of military pay, more fully discussed later, new singles were grouped with married officers (with dependents). However, when examining the decision to stay or leave the military service, new singles were grouped with singles. As noted, singles compose 42 percent of all physicians-53 percent of GMOs

TABLE 28

STAY OR LEAVE DECISION BY MARITAL STATUS

DELCD2	COUNT / ROW PCT / COL PCT / TOT PCT	SINGLE 0.I	MARRIED 1.I	NEW SING LE 2.I	ROW TOTAL
0. STAY		246	783	17	1046
	ROW PCT	23.5	74.9	1.6	69.0
	COL PCT	60.7	71.9	73.9	
	TOT PCT	16.2	51.6	1.1	
1. LEAVE		159	306	6	471
	ROW PCT	33.8	65.0	1.3	31.0
	COL PCT	39.3	28.1	26.1	
	TOT PCT	10.5	20.2	0.4	
COLUMN TOTAL		405	1089	23	1517
		26.7	71.8	1.5	100.0

NUMBER OF MISSING OBSERVATIONS = 2930

and 13 percent of EXEC. This suggests that single officers are probably younger and trained more recently. Removing obligated physicians from the sample in Table 28 indicates that 39 percent of singles and 28 percent of married non-obligated medical officers departed the Navy in FY85.

O. OSTEOPATH (OSTEO)

A physician who has been trained as an osteopath rather than receiving a medical degree (D.O. vs M.D.) may be influenced to remain in the Navy longer. Lower civilian earning potential, particularly for GMO osteopaths, and restriction of hospital privileges to osteopathic institutions may lead an osteopath to remain within the military service where he essentially receives the same treatment as his M.D. counterparts. Table 29 shows only seven percent

TABLE 29

PHYSICIAN SPECIALTY BY OSTEOPATH

DEGS45	COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSPB	9.OTHER	ROW TOTAL
0. NOT OSTEOPATH		158	936	364	184	389	222	265	433	595	3546
		4.5	26.4	10.3	5.2	11.0	6.3	7.5	12.2	16.8	93.4
		95.2	89.0	97.8	93.4	95.8	96.9	92.0	94.3	94.9	
		4.2	24.7	9.6	4.8	10.2	5.8	7.0	11.4	15.7	
1. OSTEOPATH		8	116	8	13	17	7	23	26	32	250
		3.2	46.4	3.2	5.2	6.8	2.8	9.2	10.4	12.8	6.6
		4.8	11.0	2.2	6.6	4.2	3.1	8.0	5.7	5.1	
		0.2	3.1	0.2	0.3	0.4	0.2	0.6	0.7	0.8	
COLUMN TOTAL		166	1052	372	197	406	229	288	459	627	3796
		4.4	27.7	9.8	5.2	10.7	6.0	7.6	12.1	16.5	100.0

NUMBER OF MISSING OBSERVATIONS = 651

of the physician cohort to be osteopathic and 46 percent of these 250 to be engaged as GMOs with a large number of missing values. Removing obligated physicians in Table 30 shows 46 of 100 eligible osteopathic physicians to have left the military in FY85 which is higher than the 30 percent of non-osteopaths who departed.

F. MILITARY/CIVILIAN INCOME RATIO (LINCR)

Military compensation is composed of basic pay, basic allowance for subsistence (BAS), basic allowance for quarters (BAQ), and variable housing allowance (VHA). For this study of FY85 data, all officers were given BAQ. This approximation avoided the problems involved in identifying those medical officers residing in government quarters or estimating their value. For VHA, an average was taken

TABLE 30

STAY OR LEAVE DECISION BY OSTEOPATH

DELCD2		NOT OSTEOPATH	OSTEOPATH	ROW TOTAL
		0.	1.	
STAY	0.	993	54	1047
		94.8	5.2	68.8
		69.8	54.0	
		65.2	3.5	
LEAVE	1.	429	46	475
		90.3	9.7	31.2
		30.2	46.0	
		28.2	3.0	
COLUMN TOTAL		1422	100	1522
		93.4	6.6	100.0

NUMBER OF MISSING OBSERVATIONS = 2925

of this allowance for the Naval Medical Command Washington, D.C. and the areas where the Navy's four largest hospitals are located (San Diego, CA, Oakland,CA, Pensacola, FL, and Portsmouth, VA). As was done for BAQ, the VHA rate was also differentiated for single medical officers (without dependents rate) and married or newly single officers (with dependents rate) [Ref. 17].

To obtain the military pay variable for Navy physicians several special pays must be added to the military compensation figures previously noted. Table 31 shows the multiple special pays authorized by the Uniformed Services Health Professional Pay Act of 1980. Table 32 shows the amount of Special Incentive Pay given to selected physician specialties in FY85.

TABLE 31

SPECIAL PAY FOR PHYSICIANS

LOS	VARIABLE SPECIAL PAY	ADDITIONAL SPECIAL PAY	BOARD CERT. PAY	INCENTIVE SPECIAL PAY(1)
<6	$5,000	$9,000	$2,000	<$8,000
<8	$10,000	$9,000	$2,000	<$8,000
<10	$9,500	$9,000	$2,000	<$8,000
<12	$9,000	$10,000	$2,500	<$8,000
<14	$8,000	$10,000	$3,000	<$8,000
<18	$7,000	$10,000	$4,000	<$8,000
<22	$6,000	$10,000	$5,000	<$8,000
>22	$5,000	$10,000	$5,000	<$8,000
INTERN	$1,200	0	0	0
RESID.	BY LOS	0	BY LOS	0
FLAG	$1,000	$10,000	BY LOS	0

(1) Not to exceed 6 percent of total special pays

TABLE 32
FY85 SPECIAL INCENTIVE PAY BY PHYSICIAN SPECIALTY

AMOUNT	SPECIALTY
$8000	NEUROSURGEONS, PLASTIC SURGEONS, THORACIC CARDIO-VASCULAR SURGEONS, COLON-RECTAL SURGEONS, GENERAL SURGEONS, ANESTHESIOLOGISTS, SURGICAL ONCOLOGISTS, PEDIATRIC SURGEONS, ORTHOPEDIC SURGEONS, AND PE-RIPHERAL VASCULAR SURGEONS
$5000	AEROSPACE PREVENTIVE MEDICINE OFFICERS, UROLOGISTS AND OTORHINOLARYNGOLOGISTS (EAR, NOSE, AND THROAT SPECIALIST)

SOURCE: NAVAL MEDICAL COMMAND, WASHINGTON, D.C.

TABLE 33

MEDIAN CIVILIAN PHYSICIAN EARNINGS BY SPECIALTY

SPECIALTY	1985 NET EARNINGS
Neurosurgeons	$192,670
Orthopedic surgeons	168,750
Plastic surgeons	155,170
Thoracic surgeons	151,790
Radiologists	150,000
Anesthesiologists	134,170
OBGYN specialists	121,410
General surgeons	120,830
Internists	89,630
Psychiatrists	80,380
Pediatricians	79,110
Family Practitioners	76,530
General Practitioners	71,540
All surgical specialists	132,640
All non-surgical specialists (1)	94,680
All M.D.s	102,520
Osteopaths (2)	74,000

(1) Does not include Family Pratitioners and General Practitioners.

(2) General Practitioners only.

SOURCE: MEDICAL ECONOMICS, September 8, 1986 [Ref. 14]

TABLE 34

HOSPITAL-BASED PHYSICIANS' CIVILIAN EARNINGS

SPECIALTY	1981 NET(1)	1985 NET(2)	INCREASE
RADIOLOGISTS	127,310	150,000	.18
ANESTHESIOLOGISTS	108,950	137,170	.26
PATHOLOGISTS	104,620	125,544(3)	.2(3)

(1) Source: MEDICAL ECONOMICS, March 7, 1983 [Ref. 19]

(2) Source: MEDICAL ECONOMICS, September 8, 1986 [Ref. 14]

(3) Estimate of Author

Civilian pay was estimated using a survey of 1985 annual physician earnings conducted in January 1986 by MEDICAL ECONOMICS and shown in Table 33 [Ref. 14]. For the specialty EXEC, the annual base salary for presidents/administrators for 1984 was increased by the 6.4 percent estimated to occur ($91,831)in 1985 [Ref. 18]. For pathologists (hospital based specialty), annual net earning were estimated to be $125,544 based on the estimates provided in Table 34.

A frequency analysis was conducted to examine the military and expected civilian earnings for stayers and leavers by subspecialty. These comparisons are presented in Tables 35 and 36. Additional calculations are found in Table 37 which also depict the difference in military earnings and expected civilian earnings. Some error is

TABLE 35

STAYERS AND LEAVERS MILITARY EARNINGS

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			96098434.7070	63181.0879	10647.2763	113364493.0877	(1521)
XSU8SP1	1.	EXEC	11578267.9180	73746.9294	8428.8440	71045411.8691	(157)
DELCD2	0.	STAY	10004428.5234	73561.9744	7443.7399	55409264.1064	(136)
DELCD2	1.	LEAVE	1573839.3945	74944.7331	13356.7433	178402592.8391	(21)
XSU8SP1	2.	GMO	17481924.0195	53298.5488	8629.6744	74471280.6607	(328)
DELCD2	0.	STAY	10865128.8828	57184.8889	7855.0845	61702351.7346	(190)
DELCD2	1.	LEAVE	6616795.1367	47947.7908	6545.5443	42844150.4127	(138)
XSU8SP1	3.	SURG	9003872.9258	72611.8784	9799.6140	96032434.7712	(124)
DELCD2	0.	STAY	6943361.8789	73865.5519	9135.0076	83448363.4033	(94)
DELCD2	1.	LEAVE	2060511.0469	68683.7016	10892.3177	118642584.1584	(30)
XSU8SP1	4.	OBGYN	4452006.9219	63600.0989	8637.9985	74615018.7228	(70)
DELCD2	0.	STAY	2381475.0313	66152.0842	8070.7155	65136448.1923	(36)
DELCD2	1.	LEAVE	2070531.8906	60897.9968	8503.0473	72301814.0306	(34)
XSUBSP1	5.	INTMED	10840794.4688	62663.5518	8483.9986	71978232.8486	(173)
DELCD2	0.	STAY	7663721.1016	63864.3425	7697.4758	59251134.0232	(120)
DELCD2	1.	LEAVE	3177073.3672	59944.7805	9572.1775	91626582.3718	(53)
XSU8SP1	6.	PEDS	7797206.6172	61882.5922	8421.8356	70927315.1791	(126)
DELCD2	0.	STAY	6475665.5195	63486.9169	8012.4438	64199256.3260	(102)
DELCD2	1.	LEAVE	1321541.0977	55064.2124	6605.2968	43629946.0353	(24)
XSUBSP1	7.	FAMPR	6200869.6406	60202.6179	5565.6245	30976176.5860	(103)
DELCD2	0.	STAY	3702799.0625	61713.3177	5490.6000	30146687.9376	(60)
DELCD2	1.	LEAVE	2498070.5781	58094.6646	5006.9321	25069369.1484	(43)
XSU8SP1	8.	HOSPB	10723144.0898	64210.4437	8865.1482	78590851.7361	(167)
DELCD2	0.	STAY	6827243.0352	66283.9130	7826.0114	61246453.9576	(103)
DELCD2	1.	LEAVE	3895901.0547	60873.4540	9464.5921	89578504.0725	(64)
XSU8SP1	9.	OTHER	18020348.1055	66008.6011	8209.7294	67399656.2212	(273)
DELCD2	0.	STAY	14437127.8555	66838.5549	8189.1169	67061634.9134	(216)
DELCD2	1.	LEAVE	3583220.2500	62863.5132	7561.4733	57175878.5777	(57)

TOTAL CASES = 4447
MISSING CASES = 2926 OR 65.8 PCT.

anticipated in the civilian earnings calculations due to unprogrammed losses both from the Navy and from medical school training programs. The size of the loss category for FY85 (N=492), however, is anticipated to accomodate these unusual cases without significantly altering any results.

TABLE 36

STAYERS AND LEAVERS EXPECTED CIVILIAN EARNINGS

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			145070249.0000	95378.2045	22834.8684	521431215.8167	(1521)
XSU8SP1	1.	EXEC	14417467.0000	91831.0000	0.0	0.0	(157)
DELCD2	0.	STAY	12489016.0000	91831.0000	0.0	0.0	(136)
DELCD2	1.	LEAVE	1928451.0000	91831.0000	0.0	0.0	(21)
XSU8SP1	2.	GMD	23556140.0000	71817.5000	779.4202	607495.8716	(328)
DELCD2	0.	STAY	13629500.0000	71734.2105	665.1078	442368.4211	(190)
DELCD2	1.	LEAVE	9926640.0000	71932.1739	903.8068	816866.7725	(138)
XSU8SP1	3.	SURG	16447360.0000	132640.0000	0.0	0.0	(124)
DELCD2	0.	STAY	12468160.0000	132640.0000	0.0	0.0	(94)
DELCD2	1.	LEAVE	3979200.0000	132640.0000	0.0	0.0	(30)
XSU8SP1	4.	OBGYN	8498700.0000	121410.0000	0.0	0.0	(70)
DELCD2	0.	STAY	4370760.0000	121410.0000	0.0	0.0	(36)
DELCD2	1.	LEAVE	4127940.0000	121410.0000	0.0	0.0	(34)
XSU8SP1	5.	INTMED	15505990.0000	89630.0000	0.0	0.0	(173)
DELCD2	0.	STAY	10755600.0000	89630.0000	0.0	0.0	(120)
DELCD2	1.	LEAVE	4750390.0000	89630.0000	0.0	0.0	(53)
XSU8SP1	6.	PEDS	9967860.0000	79110.0000	0.0	0.0	(126)
DELCD2	0.	STAY	8069220.0000	79110.0000	0.0	0.0	(102)
DELCD2	1.	LEAVE	1898640.0000	79110.0000	0.0	0.0	(24)
XSU8SP1	7.	FAMPR	7882590.0000	76530.0000	0.0	0.0	(103)
DELCD2	0.	STAY	4591800.0000	76530.0000	0.0	0.0	(60)
DELCD2	1.	LEAVE	3290790.0000	76530.0000	0.0	0.0	(43)
XSU8SP1	8.	HDSP8	22946502.0000	137404.2036	10408.4899	108336662.3920	(167)
DELCD2	0.	STAY	13979608.0000	135724.3495	10453.3118	109271727.8766	(103)
DELCD2	1.	LEAVE	8966894.0000	140107.7188	9823.6331	96503767.9831	(64)
XSUBSP1	9.	OTHER	25847640.0000	94680.0000	0.0	0.0	(273)
DELCD2	0.	STAY	20450880.0000	94680.0000	0.0	0.0	(216)
DELCD2	1.	LEAVE	5396760.0000	94680.0000	0.0	0.0	(57)

TOTAL CASES = 4447
MISSING CASES = 2926 OR 65.8 PCT.

TABLE 37

EXPECTED MILITARY-CIVILIAN EARNINGS DIFFERENCES

SPECIALTY	CIVILIAN INCREASE	MILPAY/CIVPAY
EXEC	$18,084	.80
GMO	18,518	.74
SURG	60,024	.55
OBGYN	57,810	.52
INTMED	26,966	.70
PEDS	17,227	.78
FAMPR	16,328	.79
HOSPB	73,194	.47
OTHER	28,671	.70
AVERAGE	$32,197	.66

IV. EMPIRICAL ANALYSIS

A. EXPLANATORY VARIABLES

Three models were developed and estimated using the LOGIT nonlinear regression technique. This technique was chosen because the dependent variable (DELCD2) is restricted to two values--either a physician stayed in the Navy (Ø) or he was a loss (1). The models were designed to estimate the effect that a number of variables had on a physician's decision to stay or leave. Most of the explanatory variables selected were dichotomous variables, coded 1 if the condition holds and Ø if it does not. Table 38 lists all the variables considered in this study.

The strengths of this model are several. First, there has been a dramatic increase in the completeness of the data over the past several years. Table 39 shows the number of missing values in the file used. Aside from additional military-specific medical training (ADD QUAL) and Osteopath, the largest number of missing observations is only four percent of the sample.

B. PROBLEMS OF MULTICOLLINEARITY

Multiple regression models assume that there is no linear relationship between the independent variables. This means that the effect of an independent variable

TABLE 38

EXPLANATORY VARIABLES CONSIDERED FOR THE MODELS

SPECIALTY

Executive Medicine
General Medical Officer
Surgeon
Obstetrician/Gynecologist
Internal Medicine
Family Practice
Pediatrician
Hospital Based
Other

SOURCE OF ENTRY

Volunteer
Prior
Armed Forces Health Profession Scholarship Program

OTHER

Military/Civilian Income Ratio
Gender
Race
Regular or Reserve Officer
Flight Medicine Qualification
Undersea Medicine Qualification
Board Certification
Citizenship
Grade
Length-of-Service
Doctor of Osteopathy (OSTEO)
Marital Status
Age
Medical School
Eligible to Retire

TABLE 39

MISSING VALUES

VARIABLE	MISSING VALUES	PERCENT
SOURCE OF ENTRY	4	Ø
PHYSICIAN SPECIALTY	52	1
INCOME RATIO	Ø	Ø
GENDER	14	Ø
RACE	132	3
REGULAR OR RESERVE	Ø	Ø
ADD QUAL	29Ø5*	-
BOARD CERTIFICATION	2	Ø
CITIZENSHIP	48	1
GRADE	2	Ø
LENGTH-OF-SERVICE	18	Ø
OSTEOPATH	6Ø2	14
MARITAL STATUS	196	4
AGE	199	4
MEDICAL SCHOOL	121	3
RETIREMENT ELIGIBLE	18	Ø

*Note: Many physicians, particularly junior medical officers, may not have received any military-specific training such as aviation or undersea medical education.

(such as LOS) on the decision variable (STAY or LEAVE) is assumed to occur while all other variables are held constant. If a linear relationship does exist--that is, if an independent variable is strongly related (either positively or negatively) to one or more of the other independent variables--than a change in this independent variable causes a corresponding change in the other, correlated variable. This causes a problem of multicollinearity. Multicollinearity or strong correlation between independent variables (such as LOS and GRADE) makes the coefficients of the regression model unreliable and unstable [Ref. 6].

TABLE 40

SELECTED CORRELATION PROBLEMS

VARIABLE	with VARIABLE	CORRELATION
LINCR	HOSPB	-.51
LINCR	REGULAR	.41
AFHPSP	REGULAR	-.52
AFHPSP	BDCERT	-.38
GMO	BDCERT	-.44
FMGRAD	VOL	.47

Appendix C lists the simple correlation coefficients of all variables within the model. As can be seen, AGE, GRADE and LOS are highly correlated with a number of the other independent variables. In addition, NOTCIT is highly correlated with the foreign medical graduate variable (.69). For this reason, these four variables (ARE, GRADE, LOS, NOTCIT) were omitted from the model.

Potential multicollinearity between other variables necessitated the construction of two models to appropriately consider the remaining variables. Table 40 presents the simple correlation coefficients between other combinations of explanatory variables. Although most of the correlations noted are not surprising, the statistical problems they create can cause difficulties for the entire model. The income ratio (LINCR), for example, is negatively correlated with HOSPB--that is, the military-civilian wage ratio for hospital-based physicians tends to be low

due to the high median civilian earnings these physicians can expect. Similarly, BDCERT physicians, by definition, are not GMOs.

Model One is briefly presented at the beginning of the next chapter to exemplify the problems associated with multicollinearity. With many variables either positively or negatively correlated with one another, the model coefficients become difficult to interpret. For example, many variables that were expected to have a significant effect are insignificant, while other variables, later shown to be insignificant, are erroneously presented as significant.

The second LOGIT explanatory model, Model Two, omits LINCR and FMGRAD in order to alleviate multicollinearity. AFHPSP was also omitted and became the comparison variable against which VOL and PRIOR were evaluated. Similarly, GMO was omitted and became the base case against which the other specialties were evaluated.

This base case distinction is important to remember for it means that the effect of a given variable on the decision to stay or leave must be evaluated as compared to the base case variable. For example, the effect of the decision to stay or leave for physicians with aviation or undersea medicine qualifications is only by comparison with physicians with OTHER qualifications. As noted in the frequency analysis earlier, we know that nearly 25

percent of OTHER physicians who were eligible to leave the service did leave in FY85. Hence, any tendency for aviation or undersea medicine physicians to stay or leave is in comparison to the characteristics embodied within the 25 percent who departed (or 75 percent who stayed).

The third LOGIT model reinstated the variables in Model Two but omitted REGULAR, BDCERT, HOSPB and VOL. HOSPB thus became the comparison variable against which the other specialties were evaluated. VOL similarly became the base case against which PRIOR and AFHPSP source of entry programs were measured.

IV. EMPIRICAL RESULTS

A. MODEL ONE

Table 41 presents the mean value for all variables in Model One discussed above. As noted, 2899 (73%) of the potential cohort of stayers were deleted from those remaining on active duty through FY85 primarily because they were obligated. Among this cohort of stayers and leavers, the average age was 41, grade was lieutenant commander, AFHPSP was 29 percent, LOS was 11 years, etc. OBGYN is annotated as having "limited dispersion" because of the small sample size (.Ø45) [Ref. 2Ø].

Previous analysis suggests that the entering cohort of physicians, noted earlier in the frequencies presented, does not necessarily indicate the mean percentage of physicians analyzed in this logistic regression. For example, 168 physicians were initially identified as executive medicine officers while 4Ø8 physicians were classified as surgeons. After eliminating those physicians who primarily have obligations to the Naval service, 1Ø percent of all physicians were executive medicine officers while only 8 percent of the surgeons remained. This variation suggests very few executive medicine officers are obligated while surgeons may either be in a four year residency or serving under obligation.

TABLE 41

MODEL ONE MEAN OBSERVATIONS

1548 OBSERVATIONS
1062 DELCD2 = 0
486 DELCD2 = 1
2899 OBSERVATIONS DELETED DUE TO MISSING VALUES

VARIABLE	MEAN	MINIMUM	MAXIMUM	RANGE
LINCR	-0.387716	-1.33806	0.11454	1.4526
PRIOR	0.297158	0	1	1
AFHPSP	0.291344	0	1	1
EXEC	0.101421	0	1	1
SURG	0.0781654	0	1	1
OBGYN	0.0452196	0	1	1*
INTMED	0.110465	0	1	1
PEDS	0.0813953	0	1	1
FAMPR	0.0658915	0	1	1
HOSP8	0.106589	0	1	1
OTHER	0.175711	0	1	1
REGULAR	0.607235	0	1	1
FMGRAD	0.136951	0	1	1
BDCERT	0.595607	0	1	1
FLIGHT	0.177003	0	1	1
UNDER	0.0587855	0	1	1
OSTEO	0.0645995	0	1	1
NOCAUC	0.121447	0	1	1
ELRET	0.122093	0	1	1
SINGLE	0.273256	0	1	1
FEMALE	0.0872093	0	1	1
AGE	41.3391	26	67	41
GRADE	4.78359	3	9	6
LOS	11.3075	1	39	38
NOTCIT	0.118863	0	1	1

* WARNING: VARIABLE HAS LIMITED DISPERSION.
IT MAY BE A BAD CANDIDATE FOR THE MODEL.

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPT ONLY= 1926.42

MODEL CHI-SQUARE= 537.06 WITH 25 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE OBTAINED IN 6 ITERATIONS. R= 0.537.
MAX ABSOLUTE DERIVATIVE=0.2536D-04. -2 LOG L= 1321.32.
MODEL CHI-SQUARE= 605.10 WITH 25 D.F. (-2 LOG L.R.) P=0.0 .

Table 41 also gives an R-value of .53. This denotes the explanatory ability of the variables to indicate whether a physician will remain in the Navy or leave. "R" has a value of zero if the model is of no value and "1" if the model predicts perfectly.

TABLE 42

MODEL ONE LOGISTIC REGRESSION PROCEDURE

VARIABLE	BETA	STD. ERRDR	CHI-SQUARE	P	R
INTERCEPT	3.89209093	0.86119696	20.42	0.0000	
L1NCR	1.06714355	0.86557996	1.52	0.2176	0.000
PRIOR	-0.18649019	0.24726031	0.57	0.4507	0.000
AFHPSP	0.49063416	0.21135308	5.39	0.0203	0.042
EXEC	0.38151464	0.42770405	0.80	0.3724	0.000
SURG	0.57496027	0.54325675	1.12	0.2899	0.000
DBGYN	1.35199872	0.57771458	5.48	0.0193	0.042
INTMED	0.56519362	0.34881536	2.63	0.1052	0.018
PEDS	-0.15104414	0.35286626	0.18	0.6686	0.000
FAMPR	0.64679580	0.32709746	3.91	0.0480	0.031
HDSP8	1.40606096	0.62080246	5.13	0.0235	0.040
OTHER	0.44324278	0.35296479	1.58	0.2092	0.000
REGULAR	-2.16730796	0.18537049	I36.70	.	-0.264
FMGRAD	-0.42535744	0.33721618	1.59	0.2072	0.000
8DCERT	-0.18196471	0.17815169	1.04	0.3071	0.000
FLIGHT	-0.65926075	0.20958360	9.89	0.0017	-0.064
UNDER	-0.17122797	0.31832396	0.29	0.5906	0.000
OSTED	0.22182665	0.27750434	0.64	0.4241	0.000
NOCAUC	-0.07227427	0.22870738	0.10	0.7520	0.000
ELRET	2.71491725	0.35545631	58.34	0.0000	0.171
SINGLE	-0.25831506	0.16795229	2.37	0.1240	-0.014
FEMALE	-0.10897246	0.24492540	0.20	0.6564	0.000
AGE	0.01065028	0.01744128	0.37	0.5414	0.000
GRADE	-0.85567663	0.17175030	24.82	0.0000	-0.109
LOS	-0.02380293	0.02869135	0.69	0.4068	0.000
NOTCIT	-0.00566999	0.34533262	0.00	0.9869	0.000

CLASSIFICATION TABLE

		PREDICTED		
		NEGATIVE	PDSITIVE	TDTAL
TRUE	NEGATIVE	935	127	1062
	POSITIVE	180	306	486
	TDTAL	1115	433	1548

SENSITIVITY: 63.0% SPECIFICITY: 88.0% CDRRECT: 80.2%
FALSE PDSITIVE RATE: 29.3% FALSE NEGATIVE RATE: 16.1%

FRACTION OF CONCDRDANT PAIRS OF PREDICTED PRD8A8ILITIES AND RESPDNSES :0.855
RANK CORRELATION 8ETWEEN PREDICTED PROBA8ILITY AND RESPONSE :0.717

In reviewing the logistic regression results in Table 42, we first examine the individual R-statistics given for each independent variable. As can be seen, the R-values are between -1 and +1 and they provide a measure of the

contribution of the variables independent of the sample size. The R-value is zero if the variable provides no partial contribution to the model. None of the R-values are +1 which would indicate it is perfectly related to the dependent variable nor -1 which would indicate a perfect inverse relationship. An example of a perfectly related variable would be to compare any variable with itself (monthly income and annual income). Conversely, civilian computer programmers would probably be nearly perfectly unrelated to the model specified, provided they were not also physicians. [Ref. 20]

Next, a review of the P-statistics indicates the significance of the estimated coefficient of the independent variables examined. As would be expected, the previously examined variables which did not contribute to the model (R-statistic = 0), were not significant at the 10 percent level. On the other hand, the most significant variable, whether a physician was designated as a reserve or augmented into the regular Navy, contributes significantly to the explanatory power of the model. The more significant (lower) the P-statistic, the more confidence can be associated with the estimated coefficient (Beta). Since the purpose of this inquiry is to determine significant characteristics which accounted for the decision of a physician to remain or leave the Naval service, the P-statistic

helps establish the level of confidence with which the independent variable's coefficient can be judged.

After reviewing the explanatory ability of the variables chosen (R-statistic) and the significance of the Beta coefficients (F-statistic), the Beta coefficients themselves are examined. These coefficients should be viewed in terms of relative magnitude rather than absolute size. Positive coefficients indicate "more likely to leave" while negative coefficients suggest "less likely to leave" the Naval service.

Examination of the independent variables shows that several are unexpectedly insignificant, while others are surprisingly significant. LOS, AGE, PRIOR, and FMGRAD are among the variables evaluated as not contributing to the model while the one variable previously evaluated as least likely to be of significance, OBGYN, is significant. In addition, LINCR, although not statistically significant, has a positive coefficient which indicates that an increase in military pay is likely to influence physicians to leave the Naval service. These results, particularly in view of the many high standard deviations indicate the disturbing effect that multicollinearity can have on a model.

To rectify as many of these correlation problems as possible, Models Two and Three were estimated. This is not meant to infer that the variables eliminated are not

significant (AGE, GRADE, LOS, NOTCIT) in the physicians decision to remain in or leave the Navy. The contrary is true. Individually and in modified regressions, the higher a physicians age, grade and length-of-service, the less likely he is to leave the Navy and these results were significant at the one percent level. Aliens and naturalized citizens (NOTCIT) were also significantly less likely to leave the Navy.

B. MODEL TWO

A second regression model was constructed which omitted the income variable (LINCR) and FMGRAD. AFHPSP and GMO were similarly deleted from this model to form the comparison variables for source of entry and physician subspecialty, respectively. Mean observations remained virtually identical and are not repeated. Overall, the reader should first note in Table 43 that every standard error in Model 2 has been reduced. This suggests that Model Two has succeeded in reducing multicollinearity problems throughout the model. Secondly, this model's explanatory R-value remains approximately the same (.51).

In examining physician specialty and level of significance (P-value), both VOL and PRIOR physicians were less likely to leave the Navy than the comparison variable AFHPSP. Previous frequency analysis showed that 57 percent of non-obligated AFHPSP physicians left the service

TABLE 43

MODEL TWO LOGISTIC REGRESSION PROCEDURE

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPT ONLY= 1940.15

MODEL CHI-SQUARE= 495.28 WITH 19 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE OBTAINED IN 6 ITERATIONS. R= 0.512.
MAX ABSOLUTE DERIVATIVE=0.3880D-07. -2 LOG L= 1394.49.
MODEL CHI-SQUARE= 545.65 WITH 19 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
INTERCEPT	1.21900311	0.19129687	40.61	0.0000	
VOL	-0.86462232	0.15801292	29.94	0.0000	-0.120
PRIOR	-1.02168504	0.22123142	21.33	0.0000	-0.100
EXEC	-0.73006504	0.33118577	4.86	0.0275	-0.038
SURG	-0.67263983	0.29109453	5.34	0.0208	-0.041
OBGYN	0.37738246	0.33113302	1.30	0.2544	0.000
INTMED	-0.19074392	0.26086497	0.53	0.4647	0.000
PEDS	-0.62900305	0.32278300	3.80	0.0513	-0.030
FAMPR	0.40193324	0.31281836	1.65	0.1988	0.000
HOSPB	0.20685903	0.25646186	0.65	0.4199	0.000
OTHER	-0.33101385	0.24525727	1.82	0.1771	0.000
REGULAR	-2.42801922	0.16985671	204.33	.	-0.323
BDCERT	-0.24026018	0.16409024	2.14	0.1431	-0.009
FLIGHT	-0.77027467	0.20145271	14.62	0.0001	-0.081
UNDER	-0.29842618	0.31217661	0.91	0.3391	0.000
OSTEO	0.25439257	0.26704654	0.91	0.3408	0.000
NOCAUC	-0.28900454	0.20469772	1.99	0.1580	0.000
ELRET	2.01339114	0.24703569	66.43	0.0000	0.182
SINGLE	-0.10400695	0.15828152	0.43	0.5111	0.000
FEMALE	-0.02318895	0.23683669	0.01	0.9220	0.000

CLASSIFICATION TABLE

		PREDICTED		
		NEGATIVE	POSITIVE	TOTAL
TRUE	NEGATIVE	916	155	1071
	POSITIVE	179	310	489
	TOTAL	1095	465	1560

SENSITIVITY: 63.4% SPECIFICITY: 85.5% CORRECT: 78.6%
FALSE POSITIVE RATE: 33.3% FALSE NEGATIVE RATE: 16.3%

FRACTION OF CONCORDANT PAIRS OF PREDICTED PROBABILITIES AND RESPONSES :0.837
RANK CORRELATION BETWEEN PREDICTED PROBABILITY AND RESPONSE :0.685

in FY85. This can be stated conversely: AFHPSP medical officers were the most likely to leave the Navy in FY85 when compared to other commissioning programs.

Of the significant (P < .1) subspecialty variables, EXEC (-.73), SURG (-.67), and PEDS (-.63) were less likely to leave the service in FY85 than GMOs. However, previous frequency analysis showed that 42 percent of non-obligated GMOs left the Navy. The other specialties were not statistically significant in a comparison with GMO as to whether they were more or less likely to leave the Naval service.

Of the remaining variables, REGULAR (-2.4) and FLIGHT (-.7) were less likely to leave. REGULAR was the most significant variable in the model with the highest explanatory ability (R=.32). FLIGHT must be compared to non-obligated physicians with OTHER additional qualifications who left the military service with a frequency of 25 percent in FY85. Also significant were physicians eligible to retire who were more likely to leave (2.Ø) than those medical officers with less that 2Ø years-of-service.

Non-caucasians were less likely to leave the Navy in FY85 than caucasians, but this statistic was not significant. This may suggest that the civilian opportunities for non-caucasians are not as good as for caucasians. Although this appears intuitively correct, this independent variable is statistically insignificant. Using a similar

explanation, females are less likely to leave the Navy than males, but again the statistic is not significant.

Board certification was not evaluated as a significant variable in the model although the indication is that they are less likely to leave the Naval service than physicians who are not board certified. This result may suggest problems within the model resulting from those physicians who are board certified but not performing in their specialty. As noted earlier, studies have indicated that the increased earnings potential of board certified physicians increases the probability of their leaving the military.

The substitute for length-of-service, ELRET, would be anticipated to show that those physicians who had served twenty years would be more likely to leave the service than those who had not. Although physician retention is not strong, the model estimates a strong liklihood that physicians eligible to retire are more likely to leave the Navy than those who are not. This result was also statistically highly significant.

The remainder of Table 43 deals with the predicted probabilities given in the model. Sensitivity (63%) is the proportion of true positives that were predicted to be positive. Specificity is the proportion of true negatives (86%) that were predicted to be negative. The false positive (33%) and false negative (16%) rates are also found within Table 43. An additional way of assessing the predictive

power of the model is given by "concordant pairs" which measures the concordance between predicted probabilities and responses (84%).

The estimated coefficients indicate the tendency of the independent variable only to be "more likely" or "less likely" to leave the Naval service. To provide a numerical interpretation of the significant ($P < .1$) variables in Model Two, elasticities were calculated for the Beta coefficients according to the following formula:

ELASTICITY = Beta * X(i) * (1-P);

where:

Beta = estimated coefficient
X(i) = mean of the independent variable (i)
P = probability of leaving = 489/156 = .313

[Ref. 6]

As shown in Table 44, a ten percent increase in the number of volunteers leads to a two percent decrease in the average probability of their leaving. Similarly, a ten percent increase in the number of augmented or regular Navy physicians indicates a ten percent average decrease in the probability of their leaving. Conversely, a ten percent increase in the number or retirement eligible physicians would lead to a 1.6 percent increase in the number of medical officers departing the Navy. As can be seen from the table, the largest elasticity is associated with a physician's status as a reserve or REGULAR Naval officer. This suggests that medical officers who apply for and successfully augment into the regular Navy, and

TABLE 44

ELASTICITY OF SELECTED VARIABLES IN MODEL TWO

VARIABLE	BETA	ELASTICITY	EFFECT ON Y OF A 10% RISE IN X(i) ON LEAVING PROB.
VOL	-.865	-.233	2.3% DECREASE
PRIOR	-1.022	-.207	2.1% DECREASE
EXEC	-.730	-.051	.5% DECREASE
SURG	-.673	-.037	.4% DECREASE
PEDS	-.629	-.035	.4% DECREASE
REGULAR	-2.428	-1.006	10.0% DECREASE
FLIGHT	-.770	-.093	.9% DECREASE
ELRET	+2.013	+.167	1.6% INCREASE

incur a two year commitment in so doing, were less likely to leave in FY85.

Table 45 shows the final parameter estimates given in a stepwise regression. Here variables have been added to the model to maximize its explanatory power (R-value) or maximize the significance of the individual coefficient. This partial correlation deletes variables not significant at the 10 percent level and lists the most significant variables after the impact of all previous variables has been eliminated.

As can be seen, the stepwise regression estimated two additional physician specialties (OTHER and INTMED) as being statistically significant in the model. Both of these physicians specialties were estimated to be less likely to leave the Naval service in FY85 than GMO. In comparing the predictive nature of this reduced model, all the statistical indicators remained virtually

TABLE 45

MODEL TWO STEPWISE REGRESSION PROCEDURE

NO ADDITIONAL VARIABLES MET THE 0.1000 SIGNIFICANCE LEVEL FOR ENTRY.

FINAL PARAMETER ESTIMATES

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
INTERCEPT	1.20189825	0.12907732	86.70	.	
REGULAR	-2.41744161	0.16641493	211.02	.	-0.328
ELRET	1.99246582	0.24150066	68.07	0.0000	0.185
VOL	-0.87905542	0.15266279	33.16	0.0000	-0.127
PRIOR	-1.00388264	0.21677838	21.45	0.0000	-0.100
FLIGHT	-0.78911577	0.19119036	17.04	0.0000	-0.088
SURG	-0.88995464	0.25250111	12.42	0.0004	-0.073
EXEC	-0.94193705	0.29463563	10.22	0.0014	-0.065
PEDS	-0.86961410	0.28210036	9.50	0.0021	-0.062
OTHER	-0.55422478	0.19883091	7.77	0.0053	-0.055
INTMED	-0.40266133	0.21883993	3.39	0.0658	-0.027

CLASSIFICATION TABLE

		PREDICTED		
		NEGATIVE	POSITIVE	TOTAL
TRUE	NEGATIVE	917	154	1071
	POSITIVE	190	299	489
	TOTAL	1107	453	1560

SENSITIVITY: 61.1% SPECIFICITY: 85.6% CORRECT: 77.9%
FALSE POSITIVE RATE: 34.0% FALSE NEGATIVE RATE: 17.2%

FRACTION OF CONCORDANT PAIRS OF PREDICTED PROBABILITIES AND RESPONSES :0.824
RANK CORRELATION BETWEEN PREDICTED PROBABILITY AND RESPONSE :0.680

the same. This suggests that the eliminated variables add little to the predictive power of the original model. The stepwise regression also altered the coefficients and intercept for all the selected variables. In the case of surgeons (-.88 vs previous -.67), for example, they are still less likely to leave the Navy than GMOs, but this revised coefficient has not changed the SURG relationship with the other subspecialties estimated as

significant. Again, the coefficients for physician specialty are not to be assessed in terms of absolute size, but relative magnitude.

C. MODEL THREE

A final model was estimated using the LOGIT nonlinear estimation technique which included the previously omitted variables in Model Two (LINCR, AFHPSP, GMO, FMGRAD) and elimated the following: VOL, HOSPB, REGULAR, BDCERT. As in Model Two, AGE, GRADE, LOS and NOTCIT were also eliminated. Of initial importance is the drop in the overall explanatory power of the model (R-value) from .51 to .39. This probably is the result of eliminating REGULAR from the new model when it was the most significant variable in both Models One and Two. Secondly, Table 46 shows that the majority of standard errors have again dropped marginally.

The first variable, the natural log of the military-civilian income ratio is statistically significant. This positive coefficient indicates that a rise in military income narrows the gap between military and estimated civilian earnings, and thus suggests that Navy physicians would be less likely to leave the service if given an increase in pay. The new significance of LINCR also indicates that the model has reduced multicollinearity.

TABLE 46

MODEL THREE LOGISTIC REGRESSION PROCEDURE

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPT ONLY= 1940.15

MODEL CHI-SQUARE= 309.53 WITH 19 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE OBTAINED IN 6 ITERATIONS. R= 0.387.
MAX ABSOLUTE DERIVATIVE=0.3059D-11. -2 LOG L= 1611.85.
MODEL CHI-SQUARE= 328.30 WITH 19 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
INTERCEPT	-1.17965256	0.31281837	14.22	0.0002	
LINCR	-1.44424797	0.39040027	13.69	0.0002	-0.078
PRIOR	-0.86952330	0.18992278	20.96	0.0000	-0.099
AFHPSP	1.01058088	0.16127029	39.27	0.0000	0.139
EXEC	-1.04789415	0.32848394	10.18	0.0014	-0.065
GMO	0.25531381	0.25369299	1.01	0.3142	0.000
SURG	-0.91613138	0.27422365	11.16	0.0008	-0.069
OBGYN	-0.10514007	0.30655022	0.12	0.7316	0.000
INTMED	-0.33809133	0.26119740	1.68	0.1955	0.000
PEDS	-0.72090467	0.32570189	4.90	0.0269	-0.039
FAMPR	0.21056949	0.31947163	0.43	0.5098	0.000
OTHER	-0.65292366	0.24367731	7.18	0.0074	-0.052
FMGRAD	-0.65159938	0.22727468	8.22	0.0041	-0.057
FLIGHT	-0.83667437	0.18727277	19.96	0.0000	-0.096
UNDER	-0.62272411	0.28942488	4.63	0.0314	-0.037
OSTEO	0.33454868	0.24021564	1.94	0.1637	0.000
NOCAUC	-0.07800417	0.19479397	0.16	0.6888	0.000
ELRET	1.42998225	0.22877291	39.07	0.0000	0.138
SINGLE	0.00562052	0.14453855	0.00	0.9690	0.000
FEMALE	-0.00784212	0.21870423	0.00	0.9714	0.000

CLASSIFICATION TABLE

		PREDICTED		
		NEGATIVE	POSITIVE	TOTAL
TRUE	NEGATIVE	947	124	1071
	POSITIVE	273	216	489
	TOTAL	1220	340	1560

SENSITIVITY: 44.2% SPECIFICITY: 88.4% CORRECT: 74.6%
FALSE POSITIVE RATE: 36.5% FALSE NEGATIVE RATE: 22.4%

FRACTION OF CONCORDANT PAIRS OF PREDICTED PROBABILITIES AND RESPONSES :0.766
RANK CORRELATION BETWEEN PREDICTED PROBABILITY AND RESPONSE :0.544

For a physician's source of entry, both PRIOR and AFHPSP are statistically significant when compared to VOL. Non-obligated volunteer physicians departed the Navy at the 25 percent rate in FY85. The coefficients indicate that AFHPSP physicians were again more likely to leave the Naval service than volunteers or PRIOR commissioned officers.

In examining specialty, EXEC (1.0), SURG (-.91), PEDS (-.72) and OTHER (-.65) are all less likely to leave the military service than hospital-based physicians. Previous frequency analysis showed hospital-based physicians who were not obligated to have left the Navy at the rate of 39 percent in FY85. These results are quite similar to those found in Model Two in terms of relative magnitude which suggests a consistency in Models Two and Three.

When compared with physicians who have received additional qualifications, FLIGHT remains significant and continues to suggest that these physicians are less likely to leave the Navy (-.83) In addition, physicians with undersea medicine qualifications are also statistically significant and less likely to leave the Navy (-.62). UNDER was not significant in Model Two although the coefficient suggested they were less likely to leave. Aerospace and undersea medicine qualifications involve voluntary education in subspecialties not easily transferred to the private sector. This may suggest why physicians who

seek this training are less likely to leave the Naval service.

Of the other variables included in this model, FMGRAD (-.65) and ELRET (1.4) were significant at the one percent level. Foreign medical graduates is one of the variables added to this model and suggests these physicians are less likely to leave the Navy that their U.S. educated peers. Physicians eligible to retire, as in Model Two, continue to be inclined to leave the Navy.

The change in variables from the previous model has also altered the predicted probabilities given. Sensitivity or the proportion of true positives has dropped from 63 percent to 44 percent. Specificity or the proportion of true positives has dropped from 88 to 86 percent. Similarly, the false positive rate has risen slightly (33 to 37 percent) and the false negative rate has also risen from 16 to 22 percent. Lastly, the concordance between predicted probabilities and responses has dropped from 84 to 77 percent. These results, combined with the now lower R-value of Model Three previously noted, suggest that the reduction in correlation sought by establishing this model has been at the expense of its overall explanatory power.

Table 47 presents the elasticities for the significant variables in Model Three. An increase in AFHPSP now leads to an overal increase in the average probability of leaving.

TABLE 47

ELASTICITY OF SELECTED VARIABLES IN MODEL THREE

VARIABLES	BETA	ELASTICITY	EFFECT ON Y OF A 10% RISE IN X(i) ON LEAVING PROB.
LINCR	-1.444	-.992	+9.9% DECREASE
PRIOR	-.870	-.176	-.2% DECREASE
AFHPSP	+1.011	+.206	+2.1% INCREASE
EXEC	-1.048	-.073	-.7% DECREASE
SURG	-.916	-.050	-.5% DECREASE
PEDS	-.721	-.040	-.4% DECREASE
OTHER	-.653	-.079	-.8% DECREASE
FMGRAD	-.652	-.061	-.6% DECREASE
FLIGHT	-.837	-.101	-1.0% DECREASE
UNDER	-.623	-.025	-.3% DECREASE
ELRET	+1.430	+.119	+1.2% INCREASE

This is the result of changing the comparison variable to VOL from the previous model. Similarly, a ten percent increase in foreign medical graduates reduces the average probability of leaving. Lastly, a ten percent increase in the military-civilian income ratio increases the probability of physicians remaining in service. The income variable also has the largest elasticity in Model Three which suggests the importance of military pay in the Navy physician's retention decision in FY85.

Table 48 presents the final parameter estimates given in a stepwise regression. As occurred in Model 2, the internal medicine specialty has become significant at the five percent level. This suggests that the elimination of non-contributing variables accomplished by the stepwise technique, improved the significance of INTMED as occurred in Model Two.

TABLE 48

MODEL THREE STEPWISE REGRESSION PROCEDURE

FINAL PARAMETER ESTIMATES

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
INTERCEPT	-0.90425307	0.18898130	22.90	0.0000	
AFHPSP	1.05818628	0.15384099	47.31	0.0000	0.153
LINCR	-1.14641725	0.29817040	14.78	0.0001	-0.081
ELRET	1.34374673	0.22078974	37.04	0.0000	0.134
PRIOR	-0.90176837	0.18688115	23.28	0.0000	-0.105
FLIGHT	-0.79532080	0.18021333	19.48	0.0000	-0.095
FMGRAD	-0.70195124	0.21512315	10.65	0.0011	-0.067
SURG	-0.99325442	0.24924208	15.88	0.0001	-0.085
UNDER	-0.59399041	0.28641710	4.30	0.0381	-0.034
EXEC	-1.19062579	0.28056641	18.01	0.0000	-0.091
OTHER	-0.79874577	0.18118281	19.43	0.0000	-0.095
PEDS	-0.91299731	0.26263139	12.08	0.0005	-0.072
INTMED	-0.48024582	0.20209126	5.65	0.0175	-0.043

CLASSIFICATION TABLE

PREDICTED

		NEGATIVE	POSITIVE	TOTAL
TRUE	NEGATIVE	946	125	1071
	POSITIVE	272	217	489
	TOTAL	1218	342	1560

SENSITIVITY: 44.4% SPECIFICITY: 88.3% CORRECT: 74.6%
FALSE POSITIVE RATE: 36.5% FALSE NEGATIVE RATE: 22.3%

FRACTION OF CONCORDANT PAIRS OF PREDICTED PROBABILITIES AND RESPONSES :0.766
RANK CORRELATION BETWEEN PREDICTED PROBABILITY AND RESPONSE :0.544

VI. CONCLUSION AND RECOMMENDATIONS

The explanatory models developed in this thesis are presented as a potential starting point from which further analysis can be performed. As noted earlier, the data set permitted only a cross-sectional analysis of the Naval Medical Corps. The combination of several years data would establish an historical data base which could allow the measurement of variables such as income that fluctuate over time rather than across the force. A time series analysis would provide a larger data set as more individuals would eventually reach their stay/leave decision point.

In addition, further research could focus on separate portions of the BUMIS File in examining the retention behavior of Medical Service, Nurse or Dental Corps Officers. For example, the stay/leave decision for dental officers would be anticipated to be quite different from the behavior of medical officers. Similarly, sources of entry, pay differential and obligated service for nonmedical staff corps officers may suggest an entirely different set of incentives and behavior for these non-physician health care professionals.

Several significant conclusions can be drawn from the explanatory models developed in this study. First, a physician's specialty plays an important role in explaining

loss behavior. Specifically, executive medicine officers, surgeons, pediatricians, OTHER, and internists were less likely to leave the Navy than general medical officers and hospital-based physicians. These results, however, must be tempered by the frequency analysis, which indicated that both 42 percent of non-obligated general medical officers and 39 percent of non-obligated hospital-based physicians who could leave the Navy in FY85 did so.

The results from the analysis of source of entry are also significant. AFHPSP, the major source of entry for Navy physicians in FY85, are more likely to leave military service than directly commissioned volunteers, while medical officers previously commissioned under the Berry, Early Commissioning and Medical-Osteopathic Scholarship Programs are less likely to leave than both the aforementioned. The retention behavior of USUHS graduates was not evaluated due to the obligation under which these officers were serving in FY85. This could indicate the current mainstay of Navy physician recruitment/procurement, AFHPSP, concurrently poses a future retention problem if these medical officers continue to depart shortly after completing their obligated service.

Of the other significant variables, physicians were less likely to leave if they received an increase in military pay, were augmented into the regular Navy, had received aviation medicine training, or were a foreign medical

graduate. The following variables were not significant at the 10 percent level: race, gender, single, osteopath, marital status, and board certification. Physicians having undersea medicine qualifications were less likely to leave the Navy in Model Two and Three, but this factor was significant at the 10 percent level only in Model Three.

Several variables were omitted from the models due to correlation problems with the other independent variables. Each of these variables, in separate modified regressions, however, was statitically significant. Specifically, the higher a medical officer's GRADE, AGE and LOS, the less likely he was to leave the Navy in FY85. Similarly, aliens and naturalized citizens were also less likely to leave the service.

Based on the previous analysis, several recommendations are suggested in view of the low retention rate for military medical officer officers, the additional difficulty of maintaining the appropriate mix of physicians by specialty, and the desired alteration of the current Naval Medical Corps to a more surgically-oriented force. The first recommendation discusses the importance of increasing military pay for certain physician specialties. The second addresses the advantages of lengthening obligated service time for some Navy-sponsored residency training programs.

A major objective of this thesis was to analyze the relative effect of economic versus non-economic factors

in explaining retention. The correctly specified models verify the importance of economic variables. Table 47 indicated that the military-civilian pay variable had the highest elasticity with respect to retention. Indeed, one would find it difficult to discount the significance of military pay as a recruiting and retention factor when the average Navy medical officer in FY85 earned 64 percent of, or $34,000 less than, the pay of his civilian peer. This large pay differential becomes even more significant when one notes that the two specialties paticularly essential to the concept of operational readiness, surgeons and hospital-based physicians, earn $60,000 and $73,000 less than their average non-military counterparts, respectively. To say that this pay differential makes recruitment of these two groups difficult would be to understate the problem dramatically. In addition, the majority of Navy surgeons and some hospital-based physicians were receiving the maximum amount of special incentive pay allowed under the Uniformed Services Health Professional Pay Act of 1980. In light of the aforementioned, a review of military pay for physicians, particularly surgeons and hospital-based specialists, is recommended.

The composition of any work force is the direct result of recruiting and retention efforts. The military-civilian pay differential makes the recruitment of volunteer surgeons and hospital-based physicians extraordinarily difficult.

The retention of career Navy physicians that remained for 20 years of service or more in FY85 was 134 or 3.4 percent of all medical officers remaining in service. The bulk of Navy physicians entering the service and remaining on active duty is composed of obligated AFHPSP medical officers and those who have similarly incurred an obligation to continue on active duty--primarily through Navy-sponsored residency programs.

Approximately 260 residencies are offered each year within Navy military hospitals. An additional 70 total residencies are sponsored through civilian facilities at any one time. Physician residencies essentially range from two to four years duration. A medical officer incurs a two year obligation upon completion of his military residency regardless of time spent in training. For civilian residencies, the obligation is year-for-year.

Increasing the obligated service time for example, to a year-for-year program might prove to be a cost-effective plan for retaining future specialists. General surgeons, for example, might be obligated an additional two to three years, anesthesiologists one year, radiologists one or two years, and pathologists two years. Although the "retention" of specialists through increased obligation would not affect the force for at least four years after enactment, consideration of extending obligation past the present two years for Navy-sponsored residencies may be feasible.

Of course, the cost of this plan in terms of its effect on recruiting would have to be evaluated. For it to be effective, physician supply would have to be fairly inelastic with respect to obligation time. However, it may be possible to offset any negative effects on recruiting with additional pay, especially bonuses in those areas of critical need.

This thesis began by presenting the current overall problem of retaining military physicians and the additional difficulties of altering the mix of medical officers to substantially increase the number, although not targeted, of surgeons and hospital-based doctors. Subsequent frequency and regression analysis suggested a number of significant factors which improved or lessened the probability of a physician remaining in the Naval service. For surgeons and hospital-based medical officers, particularly identified as important in raising the level of combat readiness desired in Navy medicine, two policy recommendations--increasing military pay and lengthening obligated service for Navy-sponsored residency programs--were presented. As the reality of increasing military pay for surgeons and hospital-based physicians by only half the estimated FY85 shortfall with median civilian earnings involves an annual increase of $30,000 and $36,000 respectively, the importance of increasing obligated service time for Navy-sponsored residency programs may appear especially attractive. This lengthening of obligated service, together

with an increase in the number of Navy-sponsored residency billets in these desired specialties, unfortunately, will not begin to alter the structure of the force for at least five and usually six years from enactment when these additional years of obligated service begin to be served by surgeons and hospital-based physicians.

APPENDIX A

PHYSICIAN SPECIALTY BY LENGTH-OF-SERVICE

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPB	OTHER	ROW TOTAL
	1.	2.	3.	4.	5.	6.	7.	8.	9.	
0.	0	219	5	2	0	1	0	1	2	230
	0.0	95.2	2.2	0.9	0.0	0.4	0.0	0.4	0.9	5.3
	0.0	14.8	1.2	1.0	0.0	0.4	0.0	0.2	0.3	
	0.0	5.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
1.	0	391	17	14	19	15	18	25	19	518
	0.0	75.5	3.3	2.7	3.7	2.9	3.5	4.8	3.7	11.8
	0.0	26.4	4.2	6.7	4.5	6.3	6.0	5.0	2.9	
	0.0	8.9	0.4	0.3	0.4	0.3	0.4	0.6	0.4	
2.	0	222	42	28	30	22	32	46	36	458
	0.0	48.5	9.2	6.1	6.6	4.8	7.0	10.0	7.9	10.5
	0.0	15.0	10.3	13.5	7.1	9.2	10.6	9.3	5.5	
	0.0	5.1	1.0	0.6	0.7	0.5	0.7	1.1	0.8	
3.	0	161	32	20	50	20	46	46	43	418
	0.0	38.5	7.7	4.8	12.0	4.8	11.0	11.0	10.3	9.5
	0.0	10.9	7.9	9.6	11.8	8.3	15.2	9.3	6.6	
	0.0	3.7	0.7	0.5	1.1	0.5	1.1	1.1	1.0	
4.	2	119	32	18	40	16	26	53	64	370
	0.5	32.2	8.6	4.9	10.8	4.3	7.0	14.3	17.3	8.5
	1.2	8.0	7.9	8.7	9.4	6.7	8.6	10.7	9.9	
	0.0	2.7	0.7	0.4	0.9	0.4	0.6	1.2	1.5	
5.	2	83	44	15	31	28	26	54	50	333
	0.6	24.9	13.2	4.5	9.3	8.4	7.8	16.2	15.0	7.6
	1.2	5.6	10.8	7.2	7.3	11.7	8.6	10.9	7.7	
	0.0	1.9	1.0	0.3	0.7	0.6	0.6	1.2	1.1	
6.	0	52	44	15	49	24	42	40	49	315
	0.0	16.5	14.0	4.8	15.6	7.6	13.3	12.7	15.6	7.2
	0.0	3.5	10.8	7.2	11.5	10.0	13.9	8.1	7.6	
	0.0	1.2	1.0	0.3	1.1	0.5	1.0	0.9	1.1	
7.	4	57	31	17	39	15	23	38	54	278
	1.4	20.5	11.2	6.1	14.0	5.4	8.3	13.7	19.4	6.4
	2.4	3.8	7.6	8.2	9.2	6.3	7.6	7.7	8.3	
	0.1	1.3	0.7	0.4	0.9	0.3	0.5	0.9	1.2	
8.	2	36	38	18	34	7	22	42	53	252
	0.8	14.3	15.1	7.1	13.5	2.8	8.7	16.7	21.0	5.8
	1.2	2.4	9.3	8.7	8.0	2.9	7.3	8.5	8.2	
	0.0	0.8	0.9	0.4	0.8	0.2	0.5	1.0	1.2	
9.	4	30	19	8	24	12	12	23	38	170
	2.4	17.6	11.2	4.7	14.1	7.1	7.1	13.5	22.4	3.9
	2.4	2.0	4.7	3.8	5.6	5.0	4.0	4.6	5.9	
	0.1	0.7	0.4	0.2	0.5	0.3	0.3	0.5	0.9	

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSP8	OTHER	ROW TOTAL
	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	
10.	2	28	10	5	14	13	8	27	31	138
	1.4	20.3	7.2	3.6	10.1	9.4	5.8	19.6	22.5	3.2
	1.2	1.9	2.5	2.4	3.3	5.4	2.6	5.4	4.8	
	0.0	0.6	0.2	0.1	0.3	0.3	0.2	0.6	0.7	
11.	6	28	8	5	16	13	5	11	19	111
	5.4	25.2	7.2	4.5	14.4	11.7	4.5	9.9	17.1	2.5
	3.6	1.9	2.0	2.4	3.8	5.4	1.7	2.2	2.9	
	0.1	0.6	0.2	0.1	0.4	0.3	0.1	0.3	0.4	
12.	8	10	7	1	5	7	5	10	19	72
	11.1	13.9	9.7	1.4	6.9	9.7	6.9	13.9	26.4	1.6
	4.8	0.7	1.7	0.5	1.2	2.9	1.7	2.0	2.9	
	0.2	0.2	0.2	0.0	0.1	0.2	0.1	0.2	0.4	
13.	8	9	9	4	12	8	9	12	29	100
	8.0	9.0	9.0	4.0	12.0	8.0	9.0	12.0	29.0	2.3
	4.8	0.6	2.2	1.9	2.8	3.3	3.0	2.4	4.5	
	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.3	0.7	
14.	11	2	10	5	15	10	9	16	24	102
	10.8	2.0	9.8	4.9	14.7	9.8	8.8	15.7	23.5	2.3
	6.5	0.1	2.5	2.4	3.5	4.2	3.0	3.2	3.7	
	0.3	0.0	0.2	0.1	0.3	0.2	0.2	0.4	0.5	
15.	9	7	6	5	5	7	7	8	17	71
	12.7	9.9	8.5	7.0	7.0	9.9	9.9	11.3	23.9	1.6
	5.4	0.5	1.5	2.4	1.2	2.9	2.3	1.6	2.6	
	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.4	
16.	7	9	10	3	8	3	5	8	18	71
	9.9	12.7	14.1	4.2	11.3	4.2	7.0	11.3	25.4	1.6
	4.2	0.6	2.5	1.4	1.9	1.3	1.7	1.6	2.8	
	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.4	
17.	10	3	9	2	9	2	4	8	16	63
	15.9	4.8	14.3	3.2	14.3	3.2	6.3	12.7	25.4	1.4
	6.0	0.2	2.2	1.0	2.1	0.8	1.3	1.6	2.5	
	0.2	0.1	0.2	0.0	0.2	0.0	0.1	0.2	0.4	
18.	10	4	6	5	1	3	0	5	13	47
	21.3	8.5	12.8	10.6	2.1	6.4	0.0	10.6	27.7	1.1
	6.0	0.3	1.5	2.4	0.2	1.3	0.0	1.0	2.0	
	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.3	
19.	10	1	7	3	4	6	3	4	17	55
	18.2	1.8	12.7	5.5	7.3	10.9	5.5	7.3	30.9	1.3
	6.0	0.1	1.7	1.4	0.9	2.5	1.0	0.8	2.6	
	0.2	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.4	
20.	14	3	5	3	4	2	0	4	6	41
	34.1	7.3	12.2	7.3	9.8	4.9	0.0	9.8	14.6	0.9
	8.3	0.2	1.2	1.4	0.9	0.8	0.0	0.8	0.9	
	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	
COLUMN TOTAL	168	1482	407	208	425	240	302	496	649	4377
	3.8	33.9	9.3	4.8	9.7	5.5	6.9	11.3	14.8	100.0

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1	GMO 2	SURG 3	OBGYN 4	INTMED 5	PEDS 6	FAMPR 7	HOSPB 8	OTHER 9	ROW TOTAL
21.	12	2	7	2	4	0	0	4	5	36
	33.3	5.6	19.4	5.6	11.1	0.0	0.0	11.1	13.9	0.8
	7.1	0.1	1.7	1.0	0.9	0.0	0.0	0.8	0.8	
	0.3	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.1	
22.	3	2	1	4	2	3	0	2	5	22
	13.6	9.1	4.5	18.2	9.1	13.6	0.0	9.1	22.7	0.5
	1.8	0.1	0.2	1.9	0.5	1.3	0.0	0.4	0.8	
	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	
23.	7	1	0	1	1	1	0	2	6	19
	36.8	5.3	0.0	5.3	5.3	5.3	0.0	10.5	31.6	0.4
	4.2	0.1	0.0	0.5	0.2	0.4	0.0	0.4	0.9	
	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
24.	5	0	0	2	3	0	0	0	3	13
	38.5	0.0	0.0	15.4	23.1	0.0	0.0	0.0	23.1	0.3
	3.0	0.0	0.0	1.0	0.7	0.0	0.0	0.0	0.5	
	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	
25.	6	0	1	0	1	0	0	1	3	12
	50.0	0.0	8.3	0.0	8.3	0.0	0.0	8.3	25.0	0.3
	3.6	0.0	0.2	0.0	0.2	0.0	0.0	0.2	0.5	
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
26.	6	0	0	0	2	1	0	3	1	13
	46.2	0.0	0.0	0.0	15.4	7.7	0.0	23.1	7.7	0.3
	3.6	0.0	0.0	0.0	0.5	0.4	0.0	0.6	0.2	
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
27.	7	2	2	1	1	1	0	1	4	19
	36.8	10.5	10.5	5.3	5.3	5.3	0.0	5.3	21.1	0.4
	4.2	0.1	0.5	0.5	0.2	0.4	0.0	0.2	0.6	
	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
28.	5	0	1	1	1	0	0	1	1	10
	50.0	0.0	10.0	10.0	10.0	0.0	0.0	10.0	10.0	0.2
	3.0	0.0	0.2	0.5	0.2	0.0	0.0	0.2	0.2	
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29.	3	0	2	0	0	0	0	0	2	7
	42.9	0.0	28.6	0.0	0.0	0.0	0.0	0.0	28.6	0.2
	1.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.3	
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPB	OTHER	ROW TOTAL
	1.	2.	3.	4.	5.	6.	7.	8.	9.	
30.	3	0	2	0	0	0	0	0	1	6
	50.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	16.7	0.1
	1.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.2	
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31.	1	0	0	0	1	0	0	1	0	3
	33.3	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	0.1
	0.6	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
32.	1	0	0	0	0	0	0	0	0	1
	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
33.	0	0	0	1	0	0	0	0	0	1
	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
38.	0	1	0	0	0	0	0	0	0	1
	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
39.	0	0	0	0	0	0	0	0	1	1
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL	168	1482	407	208	425	240	302	496	649	4377
	3.8	33.9	9.3	4.8	9.7	5.5	6.9	11.3	14.8	100.0

NUMBER OF MISSING OBSERVATIONS = 70

APPENDIX B

PHYSICIAN SPECIALTY BY AGE

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSP8	OTHER	ROW TOTAL
	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1	
24.	0	2	0	0	0	0	0	0	0	2
	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25.	0	4	0	0	1	0	0	0	0	5
	0.0	80.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.1
	0.0	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26.	0	86	0	1	0	1	1	0	0	89
	0.0	96.6	0.0	1.1	0.0	1.1	1.1	0.0	0.0	2.1
	0.0	6.3	0.0	0.5	0.0	0.4	0.3	0.0	0.0	
	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27.	0	162	0	1	1	4	3	1	3	175
	0.0	92.6	0.0	0.6	0.6	2.3	1.7	0.6	1.7	4.2
	0.0	11.8	0.0	0.5	0.2	1.7	1.0	0.2	0.5	
	0.0	3.9	0.0	0.0	0.0	0.1	0.1	0.0	0.1	
28.	0	167	10	7	9	12	6	20	9	240
	0.0	69.6	4.2	2.9	3.8	5.0	2.5	8.3	3.8	5.7
	0.0	12.2	2.6	3.4	2.2	5.1	2.0	4.2	1.4	
	0.0	4.0	0.2	0.2	0.2	0.3	0.1	0.5	0.2	
29.	0	179	20	15	18	17	22	20	16	307
	0.0	58.3	6.5	4.9	5.9	5.5	7.2	6.5	5.2	7.3
	0.0	13.1	5.2	7.4	4.4	7.2	7.4	4.2	2.5	
	0.0	4.3	0.5	0.4	0.4	0.4	0.5	0.5	0.4	
30.	0	133	29	15	37	15	33	29	33	324
	0.0	41.0	9.0	4.6	11.4	4.6	10.2	9.0	10.2	7.7
	0.0	9.7	7.5	7.4	9.0	6.3	11.1	6.1	5.1	
	0.0	3.2	0.7	0.4	0.9	0.4	0.8	0.7	0.8	
31.	0	152	17	20	33	15	40	47	51	375
	0.0	40.5	4.5	5.3	8.8	4.0	10.7	12.5	13.6	8.9
	0.0	11.1	4.4	9.9	8.0	6.3	13.5	9.8	7.9	
	0.0	3.6	0.4	0.5	0.8	0.4	1.0	1.1	1.2	
32.	0	98	39	14	45	14	29	56	47	342
	0.0	28.7	11.4	4.1	13.2	4.1	8.5	16.4	13.7	8.1
	0.0	7.2	10.1	6.9	10.9	5.9	9.8	11.7	7.3	
	0.0	2.3	0.9	0.3	1.1	0.3	0.7	1.3	1.1	
33.	1	64	39	16	36	18	36	25	53	288
	0.3	22.2	13.5	5.6	12.5	6.3	12.5	8.7	18.4	6.9
	0.6	4.7	10.1	7.9	8.7	7.6	12.1	5.2	8.2	
	0.0	1.5	0.9	0.4	0.9	0.4	0.9	0.6	1.3	
34.	1	54	30	18	33	13	17	36	42	244
	0.4	22 .	12.3	7.4	13.5	5.3	7.0	14.8	17.2	5.8
	0.6	3.9	7.7	8.9	8.0	5.5	5.7	7.5	6.5	
	0.0	1.3	0.7	0.4	0.8	0.3	0.4	0.9	1.0	

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1.1	GMO 2.1	SURG 3.1	OBGYN 4.1	INTMED 5.1	PEDS 6.1	FAMPR 7.1	HOSPB 8.1	OTHER 9.1	ROW TOTAL
35.	0	39	22	12	29	13	20	28	38	201
	0.0	19.4	10.9	6.0	14.4	6.5	10.0	13.9	18.9	4.8
	0.0	2.8	5.7	5.9	7.0	5.5	6.7	5.8	5.9	
	0.0	0.9	0.5	0.3	0.7	0.3	0.5	0.7	0.9	
36.	2	34	14	11	21	8	18	27	33	168
	1.2	20.2	8.3	6.5	12.5	4.8	10.7	16.1	19.6	4.0
	1.2	2.5	3.6	5.4	5.1	3.4	6.1	5.6	5.1	
	0.0	0.8	0.3	0.3	0.5	0.2	0.4	0.6	0.8	
37.	3	18	16	10	18	8	13	22	32	140
	2.1	12.9	11.4	7.1	12.9	5.7	9.3	15.7	22.9	3.3
	1.8	1.3	4.1	4.9	4.4	3.4	4.4	4.6	5.0	
	0.1	0.4	0.4	0.2	0.4	0.2	0.3	0.5	0.8	
38.		20	11	7	18	11	8	18	20	114
	0.9	17.5	9.6	6.1	15.8	9.6	7.0	15.8	17.5	2.7
	0.6	1.5	2.8	3.4	4.4	4.6	2.7	3.8	3.1	
	0.0	0.5	0.3	0.2	0.4	0.3	0.2	0.4	0.5	
39.	2	16	20	10	16	9	7	21	26	127
	1.6	12.6	15.7	7.9	12.6	7.1	5.5	16.5	20.5	3.0
	1.2	1.2	5.2	4.9	3.9	3.8	2.4	4.4	4.0	
	0.0	0.4	0.5	0.2	0.4	0.2	0.2	0.5	0.6	
40.	3	16	9	4	14	12	8	11	29	106
	2.8	15.1	8.5	3.8	13.2	11.3	7.5	10.4	27.4	2.5
	1.8	1.2	2.3	2.0	3.4	5.1	2.7	2.3	4.5	
	0.1	0.4	0.2	0.1	0.3	0.3	0.2	0.3	0.7	
41.	6	14	15	4	9	16	12	20	21	117
	5.1	12.0	12.8	3.4	7.7	13.7	10.3	17.1	17.9	2.8
	3.6	1.0	3.9	2.0	2.2	6.8	4.0	4.2	3.3	
	0.1	0.3	0.4	0.1	0.2	0.4	0.3	0.5	0.5	
42.	11	17	12	6	11	5	5	11	29	107
	10.3	15.9	11.2	5.6	10.3	4.7	4.7	10.3	27.1	2.5
	6.5	1.2	3.1	3.0	2.7	2.1	1.7	2.3	4.5	
	0.3	0.4	0.3	0.1	0.3	0.1	0.1	0.3	0.7	
43.	7	10	11	3	13	7	6	6	15	78
	9.0	12.8	14.1	3.8	16.7	9.0	7.7	7.7	19.2	1.9
	4.2	0.7	2.8	1.5	3.1	3.0	2.0	1.3	2.3	
	0.2	0.2	0.3	0.1	0.3	0.2	0.1	0.1	0.4	
44.	9	14	6	2	5	5	1	9	20	71
	12.7	19.7	8.5	2.8	7.0	7.0	1.4	12.7	28.2	1.7
	5.4	1.0	1.5	1.0	1.2	2.1	0.3	1.9	3.1	
	0.2	0.3	0.1	0.0	0.1	0.1	0.0	0.2	0.5	

COUNT / ROW PCT / COL PCT / TOT PCT	EXEC 1.	GMO 2.	SURG 3.	OBGYN 4.	INTMED 5.	PEDS 6.	FAMPR 7.	HOSPS 8.	OTHER 9.	ROW TOTAL
45.	16	8	8	5	8	10	1	13	15	84
	19.0	9.5	9.5	6.0	9.5	11.9	1.2	15.5	17.9	2.0
	9.5	0.6	2.1	2.5	1.9	4.2	0.3	2.7	2.3	
	0.4	0.2	0.2	0.1	0.2	0.2	0.0	0.3	0.4	
46.	10	13	7	4	6	6	0	4	17	67
	14.9	19.4	10.4	6.0	9.0	9.0	0.0	6.0	25.4	1.6
	6.0	0.9	1.8	2.0	1.5	2.5	0.0	0.8	2.6	
	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.4	
47.	5	5	7	4	2	5	1	12	14	55
	9.1	9.1	12.7	7.3	3.6	9.1	1.8	21.8	25.5	1.3
	3.0	0.4	1.8	2.0	0.5	2.1	0.3	2.5	2.2	
	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.3	0.3	
48.	8	5	7	1	4	3	2	2	11	43
	18.6	11.6	16.3	2.3	9.3	7.0	4.7	4.7	25.6	1.0
	4.8	0.4	1.8	0.5	1.0	1.3	0.7	0.4	1.7	
	0.2	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.3	
49.	12	4	5	4	6	3	2	8	9	53
	22.6	7.5	9.4	7.5	11.3	5.7	3.8	15.1	17.0	1.3
	7.1	0.3	1.3	2.0	1.5	1.3	0.7	1.7	1.4	
	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	
50.	15	5	3	2	4	1	0	7	13	50
	30.0	10.0	6.0	4.0	8.0	2.0	0.0	14.0	26.0	1.2
	8.9	0.4	0.8	1.0	1.0	0.4	0.0	1.5	2.0	
	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.3	
51.	7	4	1	0	2	2	1	2	14	33
	21.2	12.1	3.0	0.0	6.1	6.1	3.0	6.1	42.4	0.8
	4.2	0.3	0.3	0.0	0.5	0.8	0.3	0.4	2.2	
	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
52.	7	6	4	1	4	1	1	6	2	32
	21.9	18.8	12.5	3.1	12.5	3.1	3.1	18.8	6.3	0.8
	4.2	0.4	1.0	0.5	1.0	0.4	0.3	1.3	0.3	
	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	
53.	6	4	5	0	1	0	0	4	4	24
	25.0	16.7	20.8	0.0	4.2	0.0	0.0	16.7	16.7	0.6
	3.6	0.3	1.3	0.0	0.2	0.0	0.0	0.8	0.6	
	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	
54.	10	3	4	1	2	1	1	3	8	33
	30.3	9.1	12.1	3.0	6.1	3.0	3.0	9.1	24.2	0.8
	6.0	0.2	1.0	0.5	0.5	0.4	0.3	0.6	1.2	
	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	

COUNT / ROW PCT / COL PCT / TOT PCT	1.EXEC	2.GMO	3.SURG	4.OBGYN	5.INTMED	6.PEDS	7.FAMPR	8.HOSPB	9.OTHER	ROW TOTAL
55.	4	0	3	2	0	0	1	1	8	19
	21.1	0.0	15.8	10.5	0.0	0.0	5.3	5.3	42.1	0.5
	2.4	0.0	0.8	1.0	0.0	0.0	0.3	0.2	1.2	
	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	
56.	5	3	2	1	0	1	0	2	1	15
	33.3	20.0	13.3	6.7	0.0	6.7	0.0	13.3	6.7	0.4
	3.0	0.2	0.5	0.5	0.0	0.4	0.0	0.4	0.2	
	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
57.	5	1	5	0	2	0	0	2	2	17
	29.4	5.9	29.4	0.0	11.8	0.0	0.0	11.8	11.8	0.4
	3.0	0.1	1.3	0.0	0.5	0.0	0.0	0.4	0.3	
	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
59.	5	1	3	1	1	0	1	3	1	16
	31.3	6.3	18.8	6.3	6.3	0.0	6.3	18.8	6.3	0.4
	3.0	0.1	0.8	0.5	0.2	0.0	0.3	0.6	0.2	
	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	
60.	0	1	2	0	1	0	1	0	1	6
	0.0	16.7	33.3	0.0	16.7	0.0	16.7	0.0	16.7	0.1
	0.0	0.1	0.5	0.0	0.2	0.0	0.3	0.0	0.2	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
61.	1	0	1	1	0	0	0	1	4	8
	12.5	0.0	12.5	12.5	0.0	0.0	0.0	12.5	50.0	0.2
	0.6	0.0	0.3	0.5	0.0	0.0	0.0	0.2	0.6	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
62.	1	0	0	0	1	0	0	1	1	4
	25.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	25.0	0.1
	0.6	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.2	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
64.	0	1	0	0	0	0	0	0	0	1
	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
65.	0	0	0	0	1	0	0	1	0	2
	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
67.	0	1	0	0	0	0	0	0	0	1
	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL	168	369	388	203	413	237	297	479	643	4197
	4.0	32.6	9.2	4.8	9.8	5.6	7.1	11.4	15.3	100.0

NUMBER OF MISSING OBSERVATIONS = 250

APPENDIX C

CORRELATION COEFFICIENTS FOR CONSTRUCTED VARIABLES

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
LINCR	4447	-0.52407663	0.24416728	-2330.5687776	-1.33805943	0.11453950
EXEC	4447	0.03777828	0.19068103	168.0000000	0	1.00000000
GMO	4447	0.33505734	0.47206359	1490.0000000	0	1.00000000
SURG	4447	0.09174725	0.28870128	408.0000000	0	1.00000000
OBGYN	4447	0.04677311	0.21117625	208.0000000	0	1.00000000
INTMED	4447	0.09579492	0.29434288	426.0000000	0	1.00000000
PEDS	4447	0.05396897	0.22598186	240.0000000	0	1.00000000
FAMPR	4447	0.06858556	0.25277649	305.0000000	0	1.00000000
HOSP8	4447	0.11221048	0.31566073	499.0000000	0	1.00000000
OTHER	4447	0.14639083	0.35353735	651.0000000	0	1.00000000
VOL	4447	0.22756915	0.41931011	1012.0000000	0	1.00000000
PRIOR	4447	0.13897009	0.34595422	618.0000000	0	1.00000000
AFHPSP	4447	0.58758714	0.49232408	2613.0000000	0	1.00000000
REGULAR	4447	0.34472678	0.47533255	1533.0000000	0	1.00000000
OSTEO	4447	0.05756690	0.23294882	256.0000000	0	1.00000000
NOCAUC	4447	0.24128626	0.42791165	1073.0000000	0	1.00000000
SINGLE	4447	0.40701597	0.49133314	1810.0000000	0	1.00000000
FEMALE	4447	0.11041151	0.31343724	491.0000000	0	1.00000000
FLIGHT	4447	0.14076906	0.34782228	626.0000000	0	1.00000000
UNDER	4447	0.04362492	0.20428208	194.0000000	0	1.00000000
BDCERT	4447	0.32628738	0.46890657	1451.0000000	0	1.00000000
FMGRAD	4447	0.06296380	0.24292515	280.0000000	0	1.00000000
ELRET	4429	0.04402800	0.20518050	195.0000000	0	1.00000000
GRADE	4445	3.91383577	1.01407723	17397.0000000	3.00000000	9.00000000
LOS	4429	6.74396026	5.99151860	29869.0000000	0	39.00000000
AGE	4248	35.67396422	7.44390276	151543.0000000	24.00000000	67.00000000
NOTCIT	4447	0.05869125	0.23507236	261.0000000	0	1.00000000
LEAVE	4447	0.11063638	0.31371660	492.0000000	0	1.00000000

CORRELATION COEFFICIENTS / PROB > |R| UNDER H0:RHO=0 / NUMBER OF OBSERVATIONS

	L1NCR	EXEC	GMO	SURG	O8GYN	1NTMED	PEDS	FAMPR	HOSP8	OTHER	VOL	PRIOR	AFHPSP
L1NCR	1.00000	0.23532	0.21189	-0.27626	-0.26015	0.05650	0.16155	0.17343	-0.51265	0.08356	0.11837	0.29760	-0.35739
L1NCR	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
EXEC	0.23532	1.00000	-0.14065	-0.06298	-0.04389	-0.06449	-0.04733	-0.05377	-0.07044	-0.08206	0.07812	0.23067	-0.22214
EXEC	0.0001	0.0000	0.0001	0.0001	0.0034	0.0001	0.0016	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
GMO	0.21189	-0.14065	1.00000	-0.22561	-0.15724	-0.23105	-0.16955	-0.19262	-0.25237	-0.29396	-0.13872	-0.22596	0.22307
GMO	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
SURG	-0.27626	-0.06298	-0.22561	1.00000	-0.07040	-0.10345	-0.07591	-0.08625	-0.11299	-0.13162	0.05416	0.03896	-0.05971
SURG	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0094	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
O8GYN	-0.26015	-0.04389	-0.15724	-0.07040	1.00000	-0.07210	-0.05291	-0.06011	-0.07875	-0.09173	-0.02625	0.01568	0.01900
O8GYN	0.0001	0.0034	0.0001	0.0001	0.0000	0.0001	0.0004	0.0001	0.0001	0.0001	0.0801	0.2957	0.2053
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
1NTMED	0.05650	-0.06449	-0.23105	-0.10345	-0.07210	1.00000	-0.07774	-0.08832	-0.11572	-0.13479	0.00921	0.02164	-0.00048
1NTMED	0.0002	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.5391	0.1490	0.9742
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
PEDS	0.16155	-0.04733	-0.16955	-0.07591	-0.05291	-0.07774	1.00000	-0.06481	-0.08491	-0.09891	0.02939	0.05940	-0.06069
PEDS	0.0001	0.0016	0.0001	0.0001	0.0004	0.0001	0.0000	0.0001	0.0001	0.0001	0.0500	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
FAMPR	0.17343	-0.05377	-0.19262	-0.08625	-0.06011	-0.08832	-0.06481	1.00000	-0.09647	-0.11238	-0.05604	-0.01900	0.07010
FAMPR	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0002	0.2053	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
HOSP8	-0.51265	-0.07044	-0.25237	-0.11299	-0.07875	-0.11572	-0.08491	-0.09647	1.00000	-0.14723	0.03134	0.00341	-0.01188
HOSP8	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0366	0.8203	0.4285
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
OTHER	0.08356	-0.08206	-0.29396	-0.13162	-0.09173	-0.13479	-0.09891	-0.11238	-0.14723	1.00000	0.07564	0.08741	-0.11697
OTHER	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
VOL	0.11837	0.07812	-0.13872	0.05416	-0.02625	0.00921	0.02939	-0.05604	0.03134	0.07564	1.00000	-0.21806	-0.64788
VOL	0.0001	0.0001	0.0001	0.0003	0.0801	0.5391	0.0500	0.0002	0.0366	0.0001	0.0000	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
PRIOR	0.29760	0.23067	-0.22596	0.03896	0.01568	0.02164	0.05940	-0.01900	0.00341	0.08741	-0.21806	1.00000	-0.47954
PRIOR	0.0001	0.0001	0.0001	0.0094	0.2957	0.1490	0.0001	0.2053	0.8203	0.0001	0.0001	0.0000	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
AFHPSP	-0.35739	-0.22214	0.22307	-0.05971	0.01900	-0.00048	-0.06069	0.07010	-0.01188	-0.11697	-0.64788	-0.47954	1.00000
AFHPSP	0.0001	0.0001	0.0001	0.0001	0.2053	0.9742	0.0001	0.0001	0.4285	0.0001	0.0001	0.0001	0.0000
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
REGULAR	0.41375	0.24092	-0.24623	-0.02729	-0.03295	0.01631	0.09269	0.00535	-0.00752	0.16541	0.10285	0.46772	-0.52936
REGULAR	0.0001	0.0001	0.0001	0.0688	0.0280	0.2768	0.0001	0.7213	0.6160	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447

CORRELATION COEFFICIENTS / PROB > |R| UNDER H0:RHO=0 / NUMBER OF OBSERVATIONS

	LINCR	EXEC	GMO	SURG	OBGYN	INTMED	PEDS	FAMPR	HOSPB	OTHER	VOL	PRIOR	AFHPSP
FLIGHT	0.16285	0.06562	0.15514	-0.05249	-0.06822	-0.07902	-0.08523	-0.06890	-0.03328	0.04456	0.09337	0.06169	-0.11536
FLIGHT	0.0001	0.0001	0.0001	0.0005	0.0001	0.0001	0.0001	0.0001	0.0265	0.0030	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
UNDER	0.11102	0.07894	0.04431	-0.04118	-0.03688	-0.02837	-0.04614	-0.01875	-0.02361	0.04236	0.01799	0.08606	-0.07602
UNMED	0.0001	0.0001	0.0031	0.0060	0.0139	0.0585	0.0021	0.2112	0.1154	0.0047	0.2303	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
BDCERT	0.23976	0.19416	-0.44726	0.06127	-0.02014	0.19067	0.10123	0.06543	0.06562	0.12698	0.21254	0.34435	-0.37860
BDCERT	0.0001	0.0001	0.0001	0.0001	0.1793	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
FMGRAD	0.06746	-0.00281	-0.05848	-0.02787	-0.00042	0.00999	0.04871	-0.03738	0.05450	0.01836	0.45770	-0.09076	-0.30565
FMGRAD	0.0001	0.8516	0.0001	0.0631	0.9775	0.5052	0.0012	0.0127	0.0003	0.2209	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
ELRET	0.24415	0.34914	-0.13120	0.01174	0.03039	0.00108	-0.01248	-0.05805	-0.02037	0.02311	-0.00042	0.36816	-0.25223
ELRET	0.0001	0.0001	0.0001	0.4349	0.0431	0.9429	0.4064	0.0001	0.1752	0.1241	0.9777	0.0001	0.0001
	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429
GRADE	0.42167	0.39962	-0.45772	0.09387	0.01457	0.07892	0.06644	-0.03749	0.04146	0.18142	0.34577	0.50165	-0.60395
GRADE	0.0001	0.0001	0.0001	0.0001	0.3315	0.0001	0.0001	0.0124	0.0057	0.0001	0.0001	0.0001	0.0001
	4445	4445	4445	4445	4445	4445	4445	4445	4445	4445	4445	4445	4445
LOS	0.47158	0.38393	-0.40029	0.05521	0.03407	0.05001	0.04253	-0.02058	0.03884	0.16286	0.11353	0.65359	-0.57339
LOS	0.0001	0.0001	0.0001	0.0002	0.0234	0.0009	0.0046	0.1708	0.0097	0.0001	0.0001	0.0001	0.0001
	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429
AGE	0.38457	0.34189	-0.35730	0.07800	0.01011	0.02089	0.02842	-0.05100	0.04971	0.14469	0.51350	0.35473	-0.65182
AGE	0.0001	0.0001	0.0001	0.0001	0.5101	0.1735	0.0640	0.0009	0.0012	0.0001	0.0001	0.0001	0.0001
	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248	4248
NOTCIT	0.04732	-0.03442	-0.06577	-0.01308	-0.01000	-0.00001	0.06315	-0.03369	0.05369	0.03733	0.35507	-0.07542	-0.22809
NOTCIT	0.0016	0.0217	0.0001	0.3833	0.5048	0.9996	0.0001	0.0247	0.0003	0.0128	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
LEAVE	0.09315	0.00907	-0.04078	-0.03760	0.03730	0.01430	-0.00810	0.02625	0.02451	-0.02844	0.07359	0.00337	-0.03800
LEAVE	0.0001	0.5452	0.0065	0.0122	0.0129	0.3405	0.5892	0.0800	0.1022	0.0579	0.0001	0.8222	0.0115
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
OSTEO	0.01942	-0.00846	0.06182	-0.05180	0.00469	-0.02468	-0.02912	0.02079	-0.00834	-0.01496	0.01322	-0.03789	0.03643
OSTEO	0.1954	0.5726	0.0001	0.0005	0.7545	0.0999	0.0521	0.1658	0.5783	0.3187	0.3780	0.0115	0.0151
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
NOCAUC	-0.17039	-0.09796	0.24216	-0.07182	-0.00296	-0.02998	-0.02072	-0.04906	-0.02232	-0.11608	-0.05914	-0.21136	0.24184
NOCAUC	0.0001	0.0001	0.0001	0.0001	0.8438	0.0456	0.1671	0.0011	0.1368	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
SINGLE	-0.15760	-0.10654	0.15084	-0.01913	-0.05779	-0.00060	-0.03177	-0.04553	0.01001	-0.04916	-0.17457	-0.14229	0.23940
SINGLE	0.0001	0.0001	0.0001	0.2022	0.0001	0.9678	0.0341	0.0024	0.5048	0.0010	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447
FEMALE	-0.08818	-0.05852	0.02506	-0.04983	0.05109	-0.00009	0.08733	-0.00760	0.00888	-0.04238	0.02441	-0.12494	0.06299
FEMALE	0.0001	0.0001	0.0947	0.0009	0.0007	0.9954	0.0001	0.6126	0.5540	0.0047	0.1036	0.0001	0.0041
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447	4447

	REGULAR	OSTEO	NOCAUC	SINGLE	FEMALE	FLIGHT	UNDER	BDCERT	FMGRAD	ELRET	GRADE	LOS	AGE
LINCR	0.41375	0.01942	-0.17039	-0.15760	-0.08818	0.16285	0.11102	0.23976	0.06746	0.24415	0.42167	0.47158	0.38457
LINCR	0.0001	0.1954	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
EXEC	0.24092	-0.00846	-0.09796	-0.10654	-0.05852	0.06562	0.07894	0.19416	-0.00281	0.34914	0.39962	0.38393	0.34189
EXEC	0.0001	0.5726	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.8516	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
GMO	-0.24623	0.06182	0.24216	0.15084	0.02506	0.15514	0.04431	-0.44726	-0.05848	-0.13120	-0.45772	-0.40029	-0.35730
GMO	0.0001	0.0001	0.0001	0.0001	0.0947	0.0001	0.0031	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
SURG	-0.02729	-0.05180	-0.07182	-0.01913	-0.04983	-0.05249	-0.04118	0.06127	-0.02787	0.01174	0.09387	0.05521	0.07800
SURG	0.0688	0.0005	0.0001	0.2022	0.0009	0.0005	0.0060	0.0001	0.0631	0.4349	0.0001	0.0002	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
OBGYN	-0.03295	0.00469	-0.00296	-0.05779	0.05109	-0.06822	-0.03688	-0.02014	-0.00042	0.03039	0.01457	0.03407	0.01011
OBGYN	0.0280	0.7545	0.8438	0.0001	0.0007	0.0001	0.0139	0.1793	0.9775	0.0431	0.3315	0.0234	0.5101
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
INTMED	0.01631	-0.02468	-0.02998	-0.00060	-0.00009	-0.07902	-0.02837	0.19067	0.00999	0.00108	0.07892	0.05001	0.02089
INTMED	0.2768	0.0999	0.0456	0.9678	0.9954	0.0001	0.0585	0.0001	0.5052	0.9429	0.0001	0.0009	0.1735
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
PEDS	0.09269	-0.02912	-0.02072	-0.03177	0.08733	-0.08523	-0.04614	0.10123	0.04871	-0.01248	0.06644	0.04253	0.02842
PEDS	0.0001	0.0521	0.1671	0.0341	0.0001	0.0001	0.0021	0.0001	0.0012	0.4064	0.0001	0.0046	0.0640
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
FAMPR	0.00535	0.02079	-0.04906	-0.04553	-0.00760	-0.06890	-0.01875	0.06543	-0.03738	-0.05805	-0.03749	-0.02058	-0.05100
FAMPR	0.7213	0.1658	0.0011	0.0024	0.6126	0.0001	0.2112	0.0001	0.0127	0.0001	0.0124	0.1708	0.0009
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
HOSP8	-0.00752	-0.00834	-0.02232	0.01001	0.00888	-0.03328	-0.02361	0.06562	0.05450	-0.02037	0.04146	0.03884	0.04971
HOSP8	0.6160	0.5783	0.1368	0.5048	0.5540	0.0265	0.1154	0.0001	0.0003	0.1752	0.0057	0.0097	0.0012
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
OTHER	0.16541	-0.01496	-0.11608	-0.04916	-0.04238	0.04456	0.04236	0.12698	0.01836	0.02311	0.18142	0.16286	0.14469
OTHER	0.0001	0.3187	0.0001	0.0010	0.0047	0.0030	0.0047	0.0001	0.2209	0.1241	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
VOL	0.10285	0.01322	-0.05914	-0.17457	0.02441	0.09337	0.01799	0.21254	0.45770	-0.00042	0.34577	0.11353	0.51350
VOL	0.0001	0.3780	0.0001	0.0001	0.1036	0.0001	0.2303	0.0001	0.0001	0.9777	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
PRIOR	0.46772	-0.03789	-0.21136	-0.14229	-0.12494	0.06169	0.08606	0.34435	-0.09076	0.36816	0.50165	0.65359	0.35473
PRIOR	0.0001	0.0115	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
AFHPSP	-0.52936	0.03643	0.24184	0.23940	0.04299	-0.11536	-0.07602	-0.37860	-0.30565	-0.25223	-0.60395	-0.57339	-0.65182
AFHPSP	0.0001	0.0151	0.0001	0.0001	0.0041	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
REGULAR	1.00000	-0.04520	-0.26749	-0.17716	-0.06682	0.09958	0.10915	0.35199	0.11585	0.28861	0.57371	0.65465	0.45211
REGULAR	0.0000	0.0026	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248

CORRELATION COEFFICIENTS / PROB > |R| UNDER H0:RHO=0 / NUMBER OF OBSERVATIONS

	REGULAR	OSTEO	NOCAUC	SINGLE	FEMALE	FLIGHT	UNDER	BDCERT	FMGRAD	ELRET	GRADE	LOS	AGE
AGE	0.45211	0.01421	-0.19119	-0.34701	-0.11196	0.09488	0.06216	0.46897	0.30378	0.44402	0.83502	0.73879	1.00000
AGE	0.0001	0.3544	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000
	4248	4248	4248	4248	4248	4248	4248	4248	4248	4246	4247	4246	4248
NOTCIT	0.07453	-0.04528	0.12974	-0.09392	0.04940	-0.05155	-0.03928	0.05477	0.69151	-0.03472	0.14769	0.03089	0.24687
NOTCIT	0.0001	0.0025	0.0001	0.0001	0.0010	0.0006	0.0088	0.0003	0.0001	0.0208	0.0001	0.0398	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
LEAVE	-0.07784	0.05441	-0.08832	-0.05144	-0.00989	-0.02321	-0.00163	0.10163	0.02663	0.11754	0.09575	0.10008	0.12208
LEAVE	0.0001	0.0003	0.0001	0.0006	0.5098	0.1218	0.9136	0.0001	0.0758	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
OSTEO	-0.04520	1.00000	-0.01979	-0.02790	-0.02854	0.03599	-0.00079	-0.04433	-0.06009	-0.04844	-0.02185	-0.03140	0.01421
OSTEO	0.0026	0.0000	0.1871	0.0629	0.0570	0.0164	0.9578	0.0031	0.0001	0.0013	0.1453	0.0366	0.3544
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
NOCAUC	-0.26749	-0.01979	1.00000	0.03773	0.02604	-0.09376	-0.08442	-0.22655	0.09183	-0.10835	-0.28649	-0.34378	-0.19119
NOCAUC	0.0001	0.1871	0.0000	0.0119	0.0825	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
SINGLE	-0.17716	-0.02790	0.03773	1.00000	0.17695	0.04239	-0.01336	-0.20558	-0.11300	-0.13078	-0.29175	-0.26484	-0.34701
SINGLE	0.0001	0.0629	0.0119	0.0000	0.0001	0.0047	0.3731	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
FEMALE	-0.06682	-0.02854	0.02604	0.17695	1.00000	-0.04769	-0.05065	-0.07837	0.04456	-0.07578	-0.11657	-0.14012	-0.11196
FEMALE	0.0001	0.0570	0.0825	0.0001	0.0000	0.0015	0.0007	0.0001	0.0030	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
FLIGHT	0.09958	0.03599	-0.09376	0.04239	-0.04769	1.00000	-0.08645	-0.03345	-0.01708	0.07461	0.10458	0.13848	0.09488
FLIGHT	0.0001	0.0164	0.0001	0.0047	0.0015	0.0000	0.0001	0.0257	0.2549	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
UNDER	0.10915	-0.00079	-0.08442	-0.01336	-0.05065	-0.08645	1.00000	0.00634	-0.04177	0.10023	0.10069	0.10940	0.06216
UNMED	0.0001	0.9578	0.0001	0.3731	0.0007	0.0001	0.0000	0.6725	0.0053	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
BDCERT	0.35199	-0.04433	-0.22655	-0.20558	-0.07837	-0.03345	0.00634	1.00000	0.05260	0.19724	0.59526	0.48762	0.46897
BDCERT	0.0001	0.0031	0.0001	0.0001	0.0001	0.0257	0.6725	0.0000	0.0004	0.0001	0.0001	0.0001	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
FMGRAD	0.11585	-0.06009	0.09183	-0.11300	0.04456	-0.01708	-0.04177	0.05260	1.00000	-0.02409	0.18185	0.05617	0.30378
FMGRAD	0.0001	0.0001	0.0001	0.0001	0.0030	0.2549	0.0053	0.0004	0.0000	0.1089	0.0001	0.0002	0.0001
	4447	4447	4447	4447	4447	4447	4447	4447	4447	4429	4445	4429	4248
ELRET	0.28861	-0.04844	-0.10835	-0.13078	-0.07578	0.07461	0.10023	0.19724	-0.02409	1.00000	0.44132	0.61558	0.44402
ELRET	0.0001	0.0013	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.1089	0.0000	0.0001	0.0001	0.0001
	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4428	4429	4246
GRADE	0.57371	-0.02185	-0.28649	-0.29175	-0.11657	0.10458	0.10069	0.59526	0.18185	0.44132	1.00000	0.82662	0.83502
GRADE	0.0001	0.1453	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001
	4445	4445	4445	4445	4445	4445	4445	4445	4445	4428	4445	4428	4247
LOS	0.65465	-0.03140	-0.34378	-0.26484	-0.14012	0.13848	0.10940	0.48762	0.05617	0.61558	0.82662	1.00000	0.73879
LOS	0.0001	0.0366	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0000	0.0001
	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429	4428	4429	4246

	NOTC1T	LEAVE
OSTEO	-0.04528	0.05441
OSTEO	0.0025	0.0003
	4447	4447
NOCAUC	0.12974	-0.08832
NOCAUC	0.0001	0.0001
	4447	4447
SINGLE	-0.09392	-0.05144
SINGLE	0.0001	0.0006
	4447	4447
FEMALE	0.04940	-0.00989
FEMALE	0.0010	0.5098
	4447	4447
FLIGHT	-0.05155	-0.02321
FLIGHT	0.0006	0.1218
	4447	4447
UNDER	-0.03928	-0.00163
UNMED	0.0088	0.9136
	4447	4447
BDCERT	0.05477	0.10163
BDCERT	0.0003	0.0001
	4447	4447
FMGRAD	0.69151	0.02663
FMGRAD	0.0001	0.0758
	4447	4447
ELRET	-0.03472	0.11754
ELRET	0.0208	0.0001
	4429	4429
GRADE	0.14769	0.09575
GRADE	0.0001	0.0001
	4445	4445
LOS	0.03089	0.10008
LOS	0.0398	0.0001
	4429	4429
AGE	0.24687	0.12208
AGE	0.0001	0.0001
	4248	4248
NOTC1T	1.00000	0.03698
NOTC1T	0.0000	0.0137
	4447	4447
LEAVE	0.03698	1.00000
LEAVE	0.0137	0.0000
	4447	4447

	NOTC1T	LEAVE
LINCR	0.04732	0.09315
LINCR	0.0016	0.0001
	4447	4447
EXEC	-0.03442	0.00907
EXEC	0.0217	0.5452
	4447	4447
GMO	-0.06577	-0.04078
GMO	0.0001	0.0065
	4447	4447
SURG	-0.01308	-0.03760
SURG	0.3833	0.0122
	4447	4447
OBGYN	-0.01000	0.03730
OBGYN	0.5048	0.0129
	4447	4447
INTMED	-0.00001	0.01430
INTMED	0.9996	0.3405
	4447	4447
PEDS	0.06315	-0.00810
PEDS	0.0001	0.5892
	4447	4447
FAMPR	-0.03369	0.02625
FAMPR	0.0247	0.0800
	4447	4447
HOSPB	0.05369	0.02451
HOSPB	0.0003	0.1022
	4447	4447
OTHER	0.03733	-0.02844
OTHER	0.0128	0.0579
	4447	4447
VOL	0.35507	0.07359
VOL	0.0001	0.0001
	4447	4447
PRIOR	-0.07542	0.00337
PRIOR	0.0001	0.8222
	4447	4447
AFMPSP	-0.22809	-0.03800
AFMPSP	0.0001	0.0113
	4447	4447
REGULAR	0.07453	-0.07784
REGULAR	0.0001	0.0001
	4447	4447

LIST OF REFERENCES

1. Smith, Paul, "DOD Wants to Replace CHAMPUS to Cut Costs," Navy Times, p. 1, 7 October 1985.

2. Smith, Paul, "Mayer Says Medical Care Mix Changing, But Kin Protected," Navy Times, p. 3, 14 October 1985.

3. Smith, Paul, "Reports in 1984 Spurred Shift in Military Medicine," Navy Times, p. 35, 16 December 1985.

4. Bush, Ted, "Navy Seeks Better Pay for Pilots to Aid Retention," Navy Times, p. 2, 20 October 1986.

5. Burlage, John, "Nuclear-Trained May Get Sweeter Special Pays," Navy Times, p. 1, 3 November 1986.

6. Pindyck, Robert S. and Rubinfeld, Daniel, Econometric Models and Economic Forecasts, 2nd ed., Chapter 10, New York: McGraw-Hill Book Co., 1985.

7. Daubert, Victoria L., Retention of Volunteer Physicians in the U.S. Air Force, p. v, Rand Corporation, February 1985.

8. Mullins, Carol M., Navy Medical Officer Retention Behavior, p. vii, Navy Personnel Research and Development Center, December 1984.

9. Cain, Russell L., Socio-economic and Personal Variables Effecting Retention of Medical Officers, pp. 71-73, Master's Thesis, Naval Postgraduate School, Monterey, California, October 1982.

10. Menifee, James T., Factors Affecting the Organization Commitment of Military Physicians, pp. 76-79, Master's Thesis, Naval Postgraduate School, Monterey, California, March 1984.

11. Hosek, Susan K., Procurement of Air Force Physicians: Scholarship or Direct Recruiting, p. v, Rand Corporation, July 1983.

12. Warner, John T. and Goldberg, Matthew S., "The Influence of Non-Pecuniary Factors on Labor Supply: The Case of Navy Enlisted Personnel," Review of Economics and Statistics, v. 66, pp. 26-35, 1984.

13. Bowman, William R., Economic Influences on Reenlistment: The Draft Era, pp. 12-43, Office of Naval Research, October 1982.

14. Owens, Arthur, "Earnings: Have They Flattened Out for Good?" Medical Economics, pp. 162-181, 8 September 1986.

15. Naval Military Personnel Command, NMPC-4 Instruction 1170.1B, Compendium of Obligation Programs for Officers, Chapter III, March 1984.

16. Owens, Arthur, "How Much Is Board Certification Worth?" Medical Economics, pp. 59-66, 10 January 1983.

17. "FY85 Variable Housing Allowance Table," Air Force Times, p. 37, 14 October 1985.

18. Collins, Linda I., "A Survey of Hospital Salaries," Hospitals, pp. 80-96, 1 November 1984.

19. Holoweiko, Mark, "Those Hospital Specialties: Alive and Very Well," Medical Economics, pp. 148-171, 7 March 1983.

20. Harrell, Frank E., Jr., SUGI Supplemental Library User's Guide, Chapter 19, SAS Institute Inc., Cary, North Carolina, 1983.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Technical Information Center Cameron Stattion Alexandria, Virginia 22304-6145	2
2.	Library, Code 0142 Naval Postgraduate School Monterey, California 93943-5002	2
3.	LCDR William P. Whalen, MSC Naval Medical Command (Code 44) 23rd and E Streets, N.W. Washington, D.C. 20372-5120	6
4.	Commander, Naval Medical Command MEDCOM-05 23rd and E Streets, N.W. Washington, D.C. 20372-5120	2
5.	Commander, Naval Medical Command MEDCOM-44 23rd and E Streets, N.W. Washington, D.C. 20372-5120	5
6.	Commander, Naval Medical Command MEDCOM-54 23rd and E Streets, N.W. Washington, D.C. 20372-5120	3
7.	Commander,Naval Medical Command MEDCOM-512 23rd and E Streets, N.W. Washington, D.C. 20372-5120	5
8.	Commander, Naval Medical Command MEDCOM-5122 23rd and E Streets, N.W. Washington, D.C. 20372-5120	3
9.	Office of the Chief of Naval Operations CODE OP-931D Washington, D.C. 20350-2000	3

10.	Office of the Chief of Naval Operations CODE OP-93C Washington, D.C. 20350-2000	3
11.	Professor Stephen L. Mehay, Code 54Mp Naval Postgraduate School Monterey, California 93943-5000	5
12.	Dr. Kenneth J. Coffey 2126 Connecticut Ave. N.W. Washington, D.C. 20008	1